

Children's Intensive Care Drug Directory (CIDD) [kid]

1st Edition



We pay our respects to the Aboriginal and Torres Strait Islander ancestors and custodians of this land, their spirits and their legacy.

The foundations laid by these ancestors—First Nations peoples—gives strength, inspiration and courage to current and future generations.

We are committed to working towards a stronger and healthier Queensland community for Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander people.

CHQ-GDL-69000 Children’s Intensive Care Drug Directory (CIDD) 1st Edition

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Cover artwork produced for Queensland Health by Gilimbaa. The motifs used represent the important network of people from Queensland communities and how they work together to empower Aboriginal and Torres Strait Islander Queenslanders to have long, healthy, productive lives.

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This book has been designed as a cognitive aid to guide best-practice and safe drug administration for any child admitted to an intensive care unit throughout Queensland. We recommend hospitals follow their usual practice for endorsement locally including presenting it to their local Medicines Advisory Committee (or equivalent) prior to use. It is designed to be used by staff with expertise and skills in the management of critically unwell children. We recommend staff become familiar with and receive training in the use of this book prior to using it. Whilst the information contained herein has gone through a vigorous checking and referencing process it is not a substitute for thinking and checking.

Clinical incidents, risks and near misses should be reported through local HHS clinical incident reporting mechanisms. We encourage local HHSs to report CIDD feedback and concerns via email: CIDD@health.qld.gov.au

Purpose

The Children's Intensive Care Drug Directory (CIDD) pronounced 'kid', is a medication infusion guide for managing critically unwell children in an intensive care setting that was sponsored by the Queensland Paediatric Critical Care Pathway Project (QPCCP) in 2021.

CIDD includes continuous infusion medications used in paediatric critical care, as determined by the CIDD working group and steering committee in 2021.

CIDD is designed for use 'at the bedside' by critical care nursing staff who prepare and administer continuous infusions to paediatric patients.

CIDD contains evidence-based and clearly referenced medicines information and is intended to reduce unwarranted variation in medication preparation and administration in paediatric critical care across Queensland Health.

CIDD aligns with international safety standards for 'best practice' critical care, by promoting the use of standardised-concentration infusions used in conjunction with Dose Error Reduction Software (DERS) on intravenous 'smart pumps'. CIDD will provide a standardised, evidence based reference where sites can further develop, review and align their paediatric 'smart pump'/DERS libraries, critical care electronic prescribing tools and local medication guidelines.

Aim

CIDD has been developed by a multidisciplinary team of Queensland Health (QH) clinicians with emergency, paediatric, and paediatric and/or adult intensive care expertise.

CIDD provides a user-friendly resource, to reduce the cognitive burden for clinicians administering continuous infusions to critically unwell children.

CIDD provides a concise guide to infusion preparation, concentration, choice of infusion device, 'usual' dose range as well as 'max dose' (listed separately), compatible fluids and critical notes or special considerations.

CIDD will help you 'tie' all those critical care threads together.



Considerations

CIDD is not a substitute for clinically appropriate, carefully checked medication infusions. The content should be used by staff with expertise and skills in the management of critically unwell children. It is designed to be used in conjunction with state and/or local resources which contain information on medicine indication, specific dose, interactions, complex medicine compatibilities, precautions and potential side effects.

Direct links to selected statewide paediatric guidelines have been embedded within CIDD. For example, guidelines for complex or highly specialised medications such as those used in metabolic disease.

To seek further information from Children's Health Queensland (CHQ) Hospital and Health Service (HHS) about access to pre-printed medication infusion labels for use in critical care environments, clinicians can email: CHQMedicationSafety@health.qld.gov.au.

Every effort has been made to align CIDD with the current Queensland Children's Hospital (QCH) Metavision® 'Tips and Tricks' and the infusions described in CHQ Paediatric Intensive Care DERS Profile. The information in CIDD reflects current available evidence and is subject to change. For references and explanations of consensus decisions, go to the supplemental information at the end of the resource.

CIDD – Putting it to use

CIDD provides a list of standard infusion concentrations suitable to be used in Queensland paediatric critical care units. The list was reviewed and agreed by the 2021 CIDD working group.

Prerequisite check:

The CIDD Steering Committee and the Queensland Paediatric Intensive Care Advisory Group (PICAG), advise all Hospital and Health Services (HHS) to **complete a safety check by** comparing the CIDD material with:

- local PICU/ICU guidelines
- local PICU/ICU DERS library
- local Metavision®

This **prerequisite check** is necessary for HHS/local ICUs endorsing the use of CIDD, as differences may exist between CIDD and the existing local guidelines, DERS library and Metavision® which would pose a safety issue.

Where the CIDD does not align with local resources, the CIDD Steering Committee and PICAG recommend HHSs update/review their local DERS libraries to align their DERS with both Metavision® and CIDD for continuous infusions.

To seek further information on DERS software please contact CHQ Medication Safety team at CHQMedicationSafety@health.qld.gov.au

'Smart pump' and Dose Error Reduction Software (DERS)

Smart intravenous infusion pumps, with Paediatric specific Dose Error Reduction Software (DERS) should be used for all paediatric patients.

The [NSQHS Medication Safety Standard 4](#) recommends ensuring that current and accurate medicines information and decision support tools are readily available to the clinical workforce for clinical decisions relating to medicine use (4.9) and that high-risk medicines are stored, prescribed, dispensed and administered safely (4.11).

Standard infusion concentrations are the gold standard for paediatric critical care, replacing the historical use of a 'weight-based dose in a standard fluid volume'. Paediatric DERS libraries should include all standard concentrations and additionally, a blank concentration for limited/selected medicines (*see 'References to support medication recommendations' table, page 75–83*).

In DERS language, a 'blank' concentration is defined as the ability to modify both the amount of medicine and the volume, to individualise a concentration. Blank concentrations are rarely required (e.g. severely fluid restricted patients or during significant medication shortages).

Consult your pharmacist/published resources for information if preparing any infusion where 'blank' concentration will be used. Medical consultant approval is recommended for use of any blank concentration prior to infusion connection.

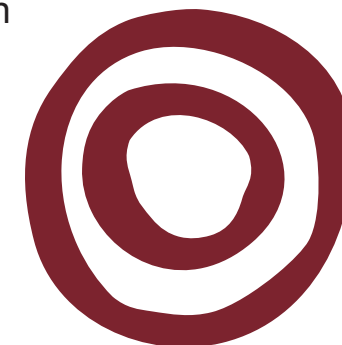
'Dose over time' medication

Not all medicines are listed in CIDD. Emergency 'once only' and intermittent 'dose over time' medication administration is beyond the scope of this resource.

Clinicians should access existing references available via Clinical Knowledge Network (CKN) such as:

- [Paediatric Injectable Guidelines \(PIG\)](#)
- [Australian Injectable Drugs Handbook \(AIDH\)](#)
- [Australian Medicines Handbook - Children's Dosing Companion \(AMHc\)](#)

In acute paediatric resuscitation situations, use the current version of the Children's Resuscitation [Emergency Drug Dosage \(CREDD\) guide](#). CREDD can be accessed via the Queensland Paediatric Emergency Care webpage. Hardcopies are available to purchase.





Ask for help early!

When caring for critically unwell paediatric patients, ask for help early.

Sites without an onsite paediatric critical care facility:

Call Retrieval Services Queensland (RSQ) on
1300 799 127

If required, Paediatric Critical Care specialists from your critical care referral site can guide clinicians through medicine preparation.

CIDD and CREDD – What's the difference?

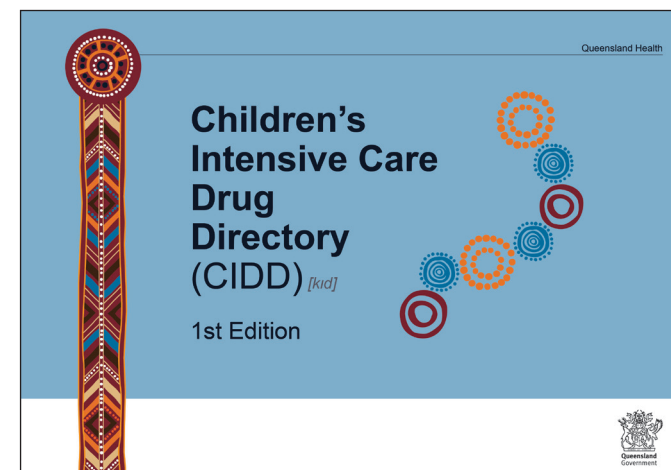
CIDD and CREDD are complementary resources. Both are recommended for sites treating paediatric patients. Where possible, the infusion concentrations used for individual medicines have been standardised between CIDD and CREDD.

Children's Intensive Care Drug Directory (CIDD):

- Use in extended and ongoing paediatric critical care requiring infusion therapy.
- An aid to use standardised continuous medication infusions.
- Aids safe patient transfer to other sites, including to PICU centres.

Children's Resuscitation Emergency Drug Dosage (CREDD):

- Resuscitation of paediatric patients in the Emergency Department setting.
- Includes single doses, doses over time, and some medication infusion information.
- Weight based resource designed to ensure prompt medicine preparation and delivery.



How to use CIDD

CIDD has a landscape presentation with one line per standard concentration and is read from left to right (*example below*). It is suitable for use in paediatric patients.

Medication:

- Medications are listed alphabetically by their generic name.
- For medications with multiple common names or where the DERS library lists under an 'indication + generic' name, an alphabetical name/place holder redirects the user to the required medicine, for example:
 - » ***Fat Emulsion for local anaesthetic toxicity*** – See *TOX Lipid 20% TOX (page 72)*
 - » ***Vasopressin*** – See *Argipressin (page 16)*
- *Italic descriptions* (below main medicine name) guide nursing staff as to when that specific profile may be most applicable.
- Where multiple concentrations for one medication exist, these are banded together down the left-hand side.

Infusion device:

- Syringe pump refers to standardised continuous infusions prepared in a syringe and delivered by a syringe pump.
- Large volume pump refers to standardised continuous infusions prepared in a fluid bag and delivered by a large volumetric pump.
- **For infants, it is recommended that a syringe pump and the *Standard Concentration* is used to administer continuous infusions.**

Final infusion concentration:

- The intended final concentration is shown both as the amount of medicine in the volume of fluid, and as a standardised concentration per unit volume.
- This concentration results when the preparation instructions are followed.

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
methADONe	methADONe	Syringe pump	100 mg/50 mL (2 mg/mL)	Dilute 100 mg to a total volume of 50 mL	Sodium Chloride 0.9%	0.01 to 0.1 mg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • <i>Specialist advice required</i> • BP, Cardiac and Respiratory rate monitoring • Reference

Preparation:

- Details the amount of medicine required, and the total volume to dilute it to.
- When using an intravenous fluid bag, first consider if you need to remove/discard any fluid (e.g. remove a volume of fluid equivalent to the volume of medicine being added to the bag). For information on initial vial reconstitution, refer to product information.
- For medicines with no dilution, the solution is described as 'undiluted'.

Compatible fluids:

- Compatible base fluids for administration.
- **Preferred fluid** for administration is **bolded** (where appropriate).
- Lists are not exhaustive for all fluid combinations. If listed fluids are not available, check compatibility of the fluid before using or ask your referral site for advice.
- Medicine/fluid compatibility is included. Medicine/Medicine compatibility is not included, refer to QH medicines information resources via CKN.
- Consider use of Micromedex for IV compatibility check.

Usual dose range for critical care:

- Weigh the child to ensure a current weight is documented for all paediatric patients. Only in emergent situations where a child cannot be weighed should an estimate be used, with the child weighed as soon as practical (given inaccuracies of estimated weight).
- Clinical judgement regarding the dose prescribed is required when the weight is significantly above or below the normal weight for age and height (i.e. extremes of body weight). Consideration should include the actual weight, adjusted weight and ideal body weight and pharmacist consultation is required.
- The dose may require titration, on medical advice, to achieve clinical effect/target. When titrating medications in critically unwell paediatric patients – escalate early if the required clinical effect is not obtained.
- Usual 'dose range' used in critical care. The dosing listed reflects available references and consensus of paediatric critical care consultants and may differ from the absolute maximum dose in published literature.
- Available, published, 'absolute' maximum doses are noted in a separate table and not included in the main table. Refer to "Reference" under special notes for a hyperlink to the position and appendix.

- Dosing units in this resource are the ‘usual’ dose units, used in paediatric critical care. Always confirm the dosing units required. When accepting a verbal or telephone instruction, ask for the prescribed dose to be spoken in full (e.g. *start at ‘10 units per kilogram per hour’ or ‘start at 10 units per hour’* rather than *start at ‘10 units’*). For safety, and to ensure unambiguous communication in a high risk situation, ask one person to receive the verbal instruction and document it, then use a second person read back of the documented order (including units) to the person who gave it, to confirm all verbal information.
- For some medicines, ‘dose capping’ at an adult dosage is applied.



Special notes

- Specific preparation or administration advice
- Type of venous access required
- Monitoring required during infusion
- Extravasation considerations
- Links to specific CHQ procedures or statewide guidelines (where appropriate)

References

- See [Reference List](#) (page 84–86) for full list of references used in the CIDD.
- Maximum dose reported in literature (which may differ from the ‘usual clinical’ maximum dose commonly required) is also listed within the Reference section of CIDD.

Appendices

- [Appendix 1: Consensus Rationale](#) (page 87)
- [Appendix 2: Glossary](#) (page 88)
- [Appendix 3: Blank Concentration Medicines](#) (page 89)
- [Appendix 4: Authors and Acknowledgements](#) (page 90–91)

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
ACETYL CYSTEINE (NAC)	Acetylcysteine (N-Acetylcysteine) <i>For use in NON-paracetamol related indications</i>	Syringe pump	2,000 mg/50 mL (40 mg/mL)	Dilute 2,000 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	4 mg/kg/hour	• Reference
	Acetylcysteine (N- Acetylcysteine) Step 1 <i>For use in paracetamol toxicity</i> <i>To be used in conjunction with CHQ-PMG-01230</i>	Large volume pump	Variable <i>Refer to guideline for information on fluid restricted patients</i>	Less than or equal 20 kg: Dilute 200 mg/kg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	200 mg/kg up to a maximum of 22,000 mg over 4 hours	• CHQ-PROC-01230 Acetylcysteine (Intravenous) for Paracetamol Poisoning • Reference
				More than 20 kg and less than 50 kg: Dilute 200 mg/kg to a total volume of 250 mL			
				More than or equal 50 kg: Dilute 200 mg/kg to a total volume of 500 mL			
	Acetylcysteine (N-Acetylcysteine) Step 2 <i>For use in paracetamol toxicity</i> <i>To be used in conjunction with CHQ-PMG-01230</i>	Large volume pump	Variable <i>Refer to guideline for information on fluid restricted patients</i>	Less than or equal 20 kg: Dilute 100 mg/kg to a total volume of 250 mL	Glucose 5%, Sodium Chloride 0.9%	100 mg/kg up to a maximum of 11,000 mg over 16 hours	• CHQ-PROC-01230 Acetylcysteine (Intravenous) for Paracetamol Poisoning • Reference
				More than 20 kg and less than 50 kg: Dilute 100 mg/kg to a total volume of 500 mL			
More than or equal 50 kg: Dilute 100 mg/kg to a total volume of 1,000 mL							

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
ADRENALINE (EPINEPHRINE)	Adrenaline (Epinephrine) <i>Standard concentration</i>	Syringe pump	1 mg/50 mL (20 microg/mL)	Dilute 1 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Adrenaline (Epinephrine) <i>Consider for fluid restricted patients</i>	Syringe pump	6 mg/50 mL (120 microg/mL)	Dilute 6 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference
	Adrenaline (Epinephrine) <i>Standard concentration</i>	Large volume pump	6 mg/100 mL (60 microg/mL)	Dilute 6 mg to a total volume of 100 mL	Sodium Chloride 0.9%, Glucose 5%	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Adrenaline (Epinephrine) <i>Consider for fluid restricted patients</i>	Large volume pump	12 mg/100 mL (120 microg/mL)	Dilute 12 mg to a total volume of 100 mL	Sodium Chloride 0.9%, Glucose 5%	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Alprostadiil (PGE1)	Syringe pump	100 microg/50 mL (2 microg/mL)	Dilute 100 microg to a total volume of 50 mL <i>Draw up diluent first to minimise contact of undiluted alprostadiil with plastic</i>	Glucose 5%, Sodium Chloride 0.9%	To open duct: 50 to 100 nanog/kg/min To maintain open duct: 5 to 20 nanog/kg/min	<ul style="list-style-type: none"> • Central access preferred • Kept in fridge • Monitor apnoea • Reference
ALTEPLASE	Alteplase <i>For patients with thromboembolism</i>	Syringe pump	1 mg/mL CHQ-GDL-01403 Alteplase (rtPA) Infusion for Thromboembolism <i>Do not shake, swirl to reconstitute</i>	—	0.5 mg/kg/hour for 6 hours (Maximum total infused dose = 100 mg/day)	<ul style="list-style-type: none"> • BP monitoring • CHQ-GDL-01403 Alteplase (rtPA) Infusion for Thromboembolism • Reference
	Alteplase <i>For patients with ischaemic stroke</i>	Syringe pump	1 mg/mL CHQ-GDL-00734 Acute Arterial Ischaemic Stroke Management in Children <i>Do not shake, swirl to reconstitute</i>	—	Bolus: 0.09 mg/kg (up to 9 mg) over 1 minute Infusion: 0.81 mg/kg (up to 81 mg) over 60 minutes (Maximum total dose 90 mg)	<ul style="list-style-type: none"> • BP monitoring • CHQ-GDL-00734 Acute Arterial Ischaemic Stroke Management in Children • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Aminocaproic Acid	Syringe pump	1,000 mg/50 mL (20 mg/mL)	Dilute 1,000 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	10 to 30 mg/kg/hour (Maximum 30 gram/day)	<ul style="list-style-type: none"> • ECMO only • Monitor Activated Clotting Time (ACT) • Reference
amiNOPHYLLine <i>Ensure loading dose is given prior to commencing infusion</i>	Syringe pump	250 mg/50 mL (5 mg/mL)	Dilute 250 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's Glucose 10%	Titrate according to serum concentrations (Maximum 1,139 mg/day unless guided by serum concentration)	<ul style="list-style-type: none"> • Central access preferred • Cardiac monitoring • Therapeutic drug monitoring • Extravasation caution • Reference
					1 month to 11 years: 1 mg/kg/hour	
					12 years or above: 0.5 to 0.7 mg/kg/hour	

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
amiODAROne	amiODAROne Less than 45 kg <i>Standard concentration for patients less than 45 kg</i>	Syringe pump	100 mg/50 mL (2 mg/mL)	Dilute 100 mg to a total volume of 50 mL <i>Use non-PVC syringes and lines: if unavailable change infusion every 12 hours</i>	Glucose 5%	Load: 5 to 6 mg/kg over 4 hours = 20 to 25 microg/kg/min for 4 hours (Maximum 300 mg)	<ul style="list-style-type: none"> • Central access preferred • 0.22 micron in-line filter recommended • BP and Cardiac monitoring • Extravasation caution • Reference
	amiODAROne Less than 45 kg <i>Consider for fluid restricted patients less than 45 kg</i>	Syringe pump	300 mg/50 mL (6 mg/mL)	Dilute 300 mg to a total volume of 50 mL <i>Use non-PVC syringes and lines: if unavailable change infusion every 12 hours</i>		Load: 5 to 6 mg/kg over 4 hours = 20 to 25 microg/kg/min for 4 hours (Maximum 300 mg)	
amiODAROne – continued on next page (page 15)							

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
amiODAROne	amiODAROne 45 kg and above <i>Standard concentration for patients 45 kg and above</i>	Large volume pump	900 mg/450 mL (2 mg/mL)	Dilute 900 mg to a total volume of 450 mL <i>Use a 500 mL bag</i> <i>Use non-PVC bags and giving sets: if unavailable change infusion every 12 hours</i>	Glucose 5%	Load: 5 mg/kg over 4 hours (Maximum 300 mg)	<ul style="list-style-type: none"> • Central access preferred • 0.22 micron in-line filter recommended • BP and Cardiac monitoring • Extravasation caution • Reference
	amiODAROne 45 kg and above <i>Alternative CREDD concentration</i>	Large volume pump	500 mg/250 mL (2 mg/mL)	Dilute 500 mg to a total volume of 250 mL <i>Use a 250 mL bag</i> <i>Use non-PVC bags and giving sets: if unavailable change infusion every 12 hours</i>		Load: 5 mg/kg over 4 hours (Maximum 300 mg)	
Arginine (L-arginine) <i>Ensure loading dose is given prior to commencing infusion</i>		Large volume pump	6,300 mg/150 mL (42 mg/mL)	Dilute to 6,300 mg to a total volume of 150 mL	Glucose 10%, Glucose 5%, Sodium Chloride 0.9%	4 to 12.5 mg/kg/hour	<ul style="list-style-type: none"> • <i>Metabolic Specialist advice required</i> • Central access preferred • Observe for anaphylaxis • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Argipressin (Vasopressin) Less than 20 kg <i>For hypotensive patients less than 20 kg</i>	Syringe pump	10 units/50 mL (0.2 units/mL)	Dilute 10 units to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.01 to 0.12 unit/kg/hour Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • Taper infusion slowly when discontinuing treatment • BP and Cardiac monitoring • Extravasation caution • SAS • Reference
Argipressin (Vasopressin) 20 kg and above <i>For hypotensive patients 20 kg and above</i>	Syringe pump	20 units/50 mL (0.4 units/mL)	Dilute 20 units to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.6 to 2.4 unit/hour Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • Taper infusion slowly when discontinuing treatment • BP and Cardiac monitoring • Extravasation caution • SAS • Reference
Argipressin DI (Vasopressin) <i>For patients with diabetes insipidus</i>	Syringe pump	1 unit/50 mL (0.02 units/mL)	Dilute 1 unit to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.001 to 0.003 unit/kg/hour Titrate in 0.001 unit/kg/hour increments at approximately 10-minute intervals to target urine output	<ul style="list-style-type: none"> • Central access preferred • Taper infusion slowly when discontinuing treatment • BP and Cardiac monitoring • Extravasation caution • SAS • Reference

Argipressin (Vasopressin) – continued on next page (page 17)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
ARGIPRESSIN (VASOPRESSIN)	Argipressin GI (Vasopressin) <i>For patients with gastrointestinal haemorrhage</i>	Syringe pump	50 units/50 mL (1 unit/mL)	Dilute 50 units to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.12 to 0.3 unit/kg/hour Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • Taper infusion slowly when discontinuing treatment • BP and Cardiac monitoring • Extravasation caution • SAS • Reference
	Argipressin GI (Vasopressin) <i>For patients with gastrointestinal haemorrhage</i>	Large volume pump	100 units/100 mL (1 unit/mL)	Dilute 100 units to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	0.12 to 0.3 unit/kg/hour Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • Taper infusion slowly when discontinuing treatment • BP and Cardiac monitoring • Extravasation caution • SAS • Reference
IAL HEP SALINE	Arterial Heparinised Saline	Syringe pump	100 units/50 mL (2 units/mL)	Draw up 100 units to a total volume of 50 mL <i>Use pre-made bag if available</i>	Sodium Chloride 0.9%	1 to 2 mL/hour Bolus flush: 1 to 2 mL	<ul style="list-style-type: none"> • Use syringe driver rather than pressure bag. Ensure bolus flushes are included in fluid balance • Reference
ATROPINE	Atropine	Syringe pump	6 mg/20 mL (0.3 mg/mL)	Dilute 6 mg to a total volume of 20 mL	Sodium Chloride 0.9%	0.02 to 0.08 mg/kg/hour Titrate every 5 minutes according to response	<ul style="list-style-type: none"> • Monitor heart rate • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Benzoate/L-arginine – See <i>Sodium Benzoate/L-arginine</i> (page 67)						
Benzoate – See <i>Sodium Benzoate</i> (page 66)						
Bicarbonate – See <i>Sodium Bicarbonate</i> (page 68)						
Bivalirudin	Syringe pump	250 mg/50 mL (5 mg/mL)	Dilute 250 mg to a total volume of 50 mL	Sodium Chloride 0.9%, Glucose 5%	0.05 to 0.25 mg/kg/hour Titrate every 3 to 4 hours to achieve target aPTT	<ul style="list-style-type: none"> • <i>Haematologist advice required</i> • Monitor aPTT • Reference
Calcium Chloride	Syringe pump	6.8 mmol/10 mL (0.68 mmol/mL)	Undiluted Draw up 6.8 mmol to a total volume of 10 mL	—	0.02 to 0.1 mmol/kg/hour Titrate to target calcium level	<ul style="list-style-type: none"> • Central access required • Monitor calcium level • Extravasation caution • CHQ-PMG-01270 Intravenous Calcium • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
CALCIUM GUCONATE	Calcium Gluconate	Syringe pump	4.4 mmol/40 mL (0.11 mmol/mL)	Dilute 4.4 mmol to a total volume of 40 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.02 to 0.1 mmol/kg/hour Titrate to target calcium level	<ul style="list-style-type: none"> • Central access preferred • Monitor calcium level • Extravasation caution • CHQ-PMG-01270 Intravenous Calcium • Reference
	Calcium Gluconate <i>For patients undergoing plasma exchange</i>	Large volume pump	4.4 mmol/100 mL (0.044 mmol/mL)	Dilute 4.4 mmol to a total volume of 100 mL	Sodium Chloride 0.9%, Glucose 5%, Hartmann's	0.044 mmol/kg/hour Titrate in increments of 0.022 mmol/kg/hour to target calcium level	<ul style="list-style-type: none"> • Central access preferred • Extravasation caution • CHQ-PMG-01270 Intravenous Calcium • CHQ-GDL-14036 Management of patients receiving Therapeutic Plasma Exchange (TPE) • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
CISATRACURIUM	Cisatracurium	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	5% Glucose, Sodium Chloride 0.9%	1 to 4 microg/kg/min Titrate to effect every 5 to 10 minutes Target Train of Four 2/4 Bolus: 100 microg/kg	<ul style="list-style-type: none"> • Ventilatory support required • Kept in fridge • Train of Four monitoring [CHQ-WI-80106] • Reversed by neostigmine • Reference
	Cisatracurium	Large volume pump	100 mg/100 mL (1 mg/mL)	Dilute 100 mg to a total volume of 100 mL	5% Glucose, Sodium Chloride 0.9%	1 to 4 microg/kg/min Titrate to effect every 5 to 10 minutes Target Train of Four 2/4 Bolus: 100 microg/kg	<ul style="list-style-type: none"> • Ventilatory support required • Kept in fridge • Train of Four monitoring [CHQ-WI-80106] • Reversed by neostigmine • Reference
Clonidine	Syringe pump	300 microg/50 mL (6 microg/mL)	Dilute 300 microg to a total volume of 50 mL	Sodium Chloride 0.9%	0.5 to 2 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP monitoring • Taper infusion slowly when discontinuing treatment (rapid discontinuation may cause hypertensive crisis) • Reference 	

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
Danaparoid <i>Ensure loading dose is given prior to commencing infusion</i>	Syringe pump	750 units/50 mL (15 units/mL)	Dilute 750 units to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	1.2 to 2 units/kg/hour Titrate to target antiXa levels	<ul style="list-style-type: none"> • Monitor antiXa • Reference 	
Desferrioxamine	Syringe pump	2,000 mg/50 mL (40 mg/mL)	Dilute 2,000 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	15 mg/kg/hour; reduce rate after 4–6 hours (Maximum 80 mg/kg, up to 6 grams in 24 hours)	<ul style="list-style-type: none"> • BP monitoring • Reduce infusion rate if hypotension occurs • Reference 	
DEXMEDETOMIDINE	Dexmedetomidine	Syringe pump	200 microg/50 mL (4 microg/mL)	Dilute 200 microg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.2 to 1 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Avoid bolus, rapid administration may cause sinus arrest • Reference
	Dexmedetomidine	Large volume pump	400 microg/100 mL (4 microg/mL)	Dilute 400 microg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.2 to 1 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Avoid bolus, rapid administration may cause sinus arrest • Reference

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
DOBUTAMINE	Dobutamine <i>Standard Concentration</i>	Syringe pump	75 mg/50 mL (1.5 mg/mL)	Dilute 75 mg to a total volume 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	2 to 10 microg/kg/min Titrate to effect every 2 to 3 minutes	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Dobutamine <i>Consider for fluid restricted patients</i>	Syringe pump	250 mg/50 mL (5 mg/mL)	Dilute 250 mg to a total volume 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	2 to 10 microg/kg/min Titrate to effect every 2 to 3 minutes	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Dobutamine	Large volume pump	250 mg/100 mL (2.5 mg/mL)	Dilute 250 mg to a total volume 100 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	2 to 10 microg/kg/min Titrate to effect every 2 to 3 minutes	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
DOPAMINE	Dopamine <i>Standard concentration</i>	Syringe pump	60 mg/50 mL (1.2 mg/mL)	Dilute 60 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	2 to 10 microg/kg/min Titrate in increments of 1 microg/kg/min every 10 minutes to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Dopamine <i>Consider for fluid restricted patients</i>	Syringe pump	200 mg/50 mL (4 mg/mL)	Dilute 200 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	2 to 10 microg/kg/min Titrate in increments of 1 microg/kg/min every 10 minutes to effect	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference
	Dopamine	Large volume pump	200 mg/100 mL (2 mg/mL)	Dilute 200 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	2 to 10 microg/kg/min Titrate in increments of 1 microg/kg/min every 10 minutes to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference

Epinephrine – See Adrenaline (page 11)

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
EPOPROSTENOL (FLOLAN®)	<p>Epoprostenol (Flolan® brand)</p> <p><i>To be used in conjunction with CHQ-GDL-01027</i></p>	Syringe pump	150 microg/50 mL (3 microg/mL)	<p>Dilute 150 microg to a total volume of 50 mL</p> <p>**Complex preparation required – refer to PIG**</p>	<p>Provided diluent only (glycine buffer)</p>	<p>Initial rate: 0.5 to 2 nanog/kg/min</p> <p>Titrate in increments of 0.5 to 2 nanog/kg/min every 15 minutes, up to 40 nanog/kg/min to achieve desired clinical effect</p>	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • Taper infusion slowly when discontinuing treatment • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference
	<p>Epoprostenol (Flolan® brand)</p> <p><i>To be used in conjunction with CHQ-GDL-01027</i></p>	Syringe pump	500 microg/50 mL (10 microg/mL)	<p>Dilute 500 microg to a total volume of 50 mL</p> <p>**Complex preparation required – refer to PIG**</p>	<p>Provided diluent only (glycine buffer)</p>	<p>Initial rate: 0.5 to 2 nanog/kg/min</p> <p>Titrate in increments of 0.5 to 2 nanog/kg/min every 15 minutes, up to 40 nanog/kg/min to achieve desired clinical effect</p>	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • Taper infusion slowly when discontinuing treatment • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference

Epoprostenol (Flolan®) – continued on next page (page 25)

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
EPOPROSTENOL CHRONIC (FLOLAN®)	Epoprostenol Chronic (Flolan® brand) <i>For use in patients with chronic pulmonary hypertension</i>	Syringe pump	500 microg/50 mL (10 microg/mL)	Dilute 500 microg to a total volume of 50 mL **Complex preparation required – refer to PIG**	Provided diluent only (glycine buffer)	5 to 80 nanog/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference
	Epoprostenol Chronic (Flolan® brand) <i>For use in patients with chronic pulmonary hypertension</i>	Large volume pump	1,000 microg/100 mL (10 microg/mL)	Dilute 1,000 microg to a total volume of 100 mL **Complex preparation required – refer to PIG**	Provided diluent only (glycine buffer)	5 to 80 nanog/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
EPOPROSTENOL (VELETRI®)	Epoprostenol (Veletri® brand) <i>To be used in conjunction with CHQ-GUDL-01027</i>	Syringe pump	150 microg/50 mL (3 microg/mL)	Dilute 150 microg to a total volume of 50 mL	Sodium Chloride 0.9%	Initial rate: 0.5 to 2 nanog/kg/min Titrate in increments of 0.5 to 2 nanog/kg/min every 15 minutes, up to 40 nanog/kg/min to achieve desired clinical effect	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • Taper infusion slowly when discontinuing treatment • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference
	Epoprostenol (Veletri® brand) <i>To be used in conjunction with CHQ-GUDL-01027</i>	Syringe pump	500 microg/50 mL (10 microg/mL)	Dilute 500 microg to a total volume of 50 mL	Sodium Chloride 0.9%	Initial rate: 0.5 to 2 nanog/kg/min Titrate in increments of 0.5 to 2 nanog/kg/min every 15 minutes, up to 40 nanog/kg/min to achieve desired clinical effect	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • Taper infusion slowly when discontinuing treatment • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference

Epoprostenol Chronic (Veletri®) – continued on next page (page 27)

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
EPOPROSTENOL CHRONIC (VELETRI®)	Epoprostenol Chronic (Veletri® brand) <i>For use in patients with chronic pulmonary hypertension</i>	Syringe pump	500 microg/50 mL (10 microg/mL)	Dilute 500 microg to a total volume of 50 mL	Sodium Chloride 0.9%	5 to 80 nanog/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference
	Epoprostenol Chronic (Veletri® brand) <i>For use in patients with chronic pulmonary hypertension</i>	Large volume pump	1,000 microg/100 mL (10 microg/mL)	Dilute 1,000 microg to a total volume of 100 mL	Sodium Chloride 0.9%	5 to 80 nanog/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central line preferred • Use 0.22 micron in-line filter • BP monitoring • Extravasation caution • CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
ESMOLOL	Esmolol	Syringe pump	500 mg/50 mL (10 mg/mL)	Undiluted Draw up 500 mg to a total volume of 50 mL	—	Initial rate: 25 to 100 microg/kg/min Titrate in increments of 25 to 50 microg/kg/min every 5 minutes to effect Bolus: 500 microg/kg	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Extravasation caution • Taper infusion slowly when discontinuing treatment • Reference
	Esmolol <i>Consider for patients 45 kg and above</i>	Large volume pump	1,000 mg/100 mL (10 mg/mL)	Undiluted Draw up 1,000 mg to a total volume of 100 mL <i>Use 100 mL empty bag or bottle</i>	—	Initial rate: 25 to 100 microg/kg/min Titrate in increments of 25 to 50 microg/kg/min every 5 minutes to effect Bolus: 500 microg/kg	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Extravasation caution • Taper infusion slowly when discontinuing treatment • Reference
Ethacrynic Acid		Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.1 to 0.5 mg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Electrolyte monitoring • SAS • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
<p>Ethanol 10%</p> <p><i>Ensure loading dose is given prior to commencing infusion</i></p>	Large volume pump	50 mL/500 mL (10%)	Dilute 50 mL of ethanol 100% to a total volume of 500 mL	Glucose 5%	1 to 2 mL/kg/hour (Maximum 100 mL/hour)	<ul style="list-style-type: none"> • Central access required • Ensure adequate mixing during preparation • CNS and Respiratory monitoring • Blood glucose monitoring • Monitor serum ethanol level • Reference

Fat Emulsion for local anaesthetic toxicity – See *TOX Lipid 20% TOX (page 72)*

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
FENTANYL	Fentanyl Less than 35 kg <i>Standard concentration for patients less than 35 kg</i>	Syringe pump	500 microg/50 mL (10 microg/mL)	Dilute 500 microg to total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.5 to 5 microg/kg/hour Titrate to effect Bolus: 0.5 to 1 microg/kg	• Respiratory rate monitoring • Reference
	Fentanyl Less than 35 kg <i>Consider for fluid restricted patients less than 35 kg</i>	Syringe pump	1,000 microg/50 mL (20 microg/mL)	Dilute 1,000 microg to total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.5 to 5 microg/kg/hour Titrate to effect Bolus: 0.5 to 1 microg/kg	• Respiratory rate monitoring • Reference
	Fentanyl 35 kg and above <i>Standard concentration for patients 35 kg and above</i>	Syringe pump	1,000 microg/50 mL (20 microg/mL)	Dilute 1,000 microg to total volume of 50mL	Glucose 5%, Sodium Chloride 0.9%	25 to 200 microg/hour Titrate to effect Bolus: 25 microg	• Respiratory rate monitoring • Reference
	Fentanyl 35 kg and above <i>Consider for fluid restricted patients 35 kg and above</i>	Syringe pump	2,500 microg/50 mL (50 microg/mL)	Undiluted Draw up 2,500 microg to a total volume of 50 mL	—	25 to 200 microg/hour Titrate to effect Bolus: 25 microg	• Respiratory rate monitoring • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Flumazenil		Syringe pump	500 microg/20 mL (25 microg/mL)	Dilute 500 microg to a total volume of 20 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	2 to 10 microg/kg/hour (Maximum 500 microg/hour) Titrate to effect Bolus: 5 microg/kg (Maximum 200 microg)	<ul style="list-style-type: none"> • Monitor for seizures • Extravasation caution • Reference
Fomepizole		Large volume pump	1,500 mg/500 mL (3 mg/mL)	Dilute 1,500 mg to a total volume of 500 mL <i>If solidified, run the vial under warm water or hold in the hand until it forms a solution</i>	Glucose 5% Sodium Chloride 0.9%	1 to 1.5 mg/kg/hour	<ul style="list-style-type: none"> • Reference
FUROSEMIDE	Furosemide <i>Standard concentration</i>	Syringe pump	100 mg/50 mL (2 mg/mL)	Dilute 100 mg to a total volume of 50 mL	Sodium Chloride 0.9%, Hartmann's	0.05 to 0.5 mg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Electrolyte monitoring • Reference
	Furosemide <i>Consider for use in fluid restricted patients</i>	Syringe pump	250 mg/50 mL (5 mg/mL)	Dilute 250 mg to a total volume of 50 mL	Sodium Chloride 0.9%, Hartmann's	0.05 to 0.5 mg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Electrolyte monitoring • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
<p>Glucagon</p> <p><i>For use in patients with hyperinsulinism</i></p>	Syringe Pump	1 mg/50 mL (0.02 mg/mL)	Dilute 1 mg to a total volume of 50 mL	Glucose 5%	1 to 20 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • <i>Specialist advice required when used for toxicology indications</i> • Monitor closely for precipitation in the syringe • Reference
Glucose 50%	Syringe Pump	25 g/50 mL (500 mg/mL)	Undiluted Draw up 25 gram to a total volume of 50 mL	—	3 to 12 mg/kg/min Titrate to target glucose level	<ul style="list-style-type: none"> • Central access required • Blood glucose monitoring • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
GLYCERYL TRINITRATE	Glyceryl Trinitrate Less than 45 kg <i>Standard concentration for patients less than 45 kg</i>	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL <i>Use non-PVC syringe and lines if available</i>	Glucose 5%, Sodium Chloride 0.9%	Initial rate: 0.2 microg/kg/min Titrate to effect in increments of 0.2 microg/kg/min every 3 to 5 minutes, up to 5 microg/kg/min	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference
	Glyceryl Trinitrate Less than 45 kg <i>Standard concentration for patients less than 45 kg</i>	Large volume pump	100 mg/100 mL (1 mg/mL)	Dilute 100 mg to a total volume of 100 mL <i>Use non-PVC bags and giving sets if available</i>	Glucose 5%, Sodium Chloride 0.9%	Initial rate: 0.2 microg/kg/min Titrate to effect in increments of 0.2 microg/kg/min every 3 to 5 minutes, up to 5 microg/kg/min	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference
	Glyceryl Trinitrate 45 kg and above <i>Standard concentration for patients 45 kg and above</i>	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL <i>Use non-PVC syringe and lines if available</i>	Glucose 5%, Sodium Chloride 0.9%	Initial rate: 5 to 10 microg/min Titrate to effect in increments of 5 microg/min every 3 to 5 minutes, up to 80 microg/min	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference
	Glyceryl Trinitrate 45 kg and above <i>Standard concentration for patients 45 kg and above</i>	Large volume pump	200 mg/250 mL (0.8 mg/mL)	Dilute 200 mg to a total volume of 250 mL <i>Use non-PVC bags and giving sets if available</i>	Glucose 5%, Sodium Chloride 0.9%	Initial rate: 5 to 10 microg/min Titrate to effect in increments of 5 microg/min every 3 to 5 minutes, up to 80 microg/min	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
HEPARIN	Heparin Standard concentration Check whether loading dose is required prior to commencing infusion	Syringe pump 5,000 units/50 mL (100 unit/mL)	Dilute 5,000 units to a total volume of 50 mL	Sodium Chloride 0.9%, Glucose 5%	Variable initial rate, refer to policy Usual range: 5 to 40 unit/kg/hour Titrate to target aPTT or antiXa every 4 to 6 hours	<ul style="list-style-type: none"> • Monitor aPTT or antiXa • CHQ-PMG-01200 Heparin Sodium (Unfractionated Heparin) • Reference
	Heparin Consider for fluid restricted patients Check whether loading dose is required prior to commencing infusion	Syringe pump 25,000 units/50 mL (500 unit/mL)	Dilute 25,000 units to a total volume of 50 mL Use pre-made syringe if available	Sodium Chloride 0.9%, Glucose 5%	Variable initial rate, refer to policy Usual range: 5 to 40 unit/kg/hour Titrate to target aPTT or antiXa every 4 to 6 hours	<ul style="list-style-type: none"> • Monitor aPTT or antiXa • CHQ-PMG-01200 Heparin Sodium (Unfractionated Heparin) • Reference
	Heparin ECLS For use in patients on ECLS	Syringe pump	5,000 units/50 mL (100 units/mL)	Dilute 5,000 units to a total volume of 50 mL	Sodium Chloride 0.9%, Glucose 5%	10 to 50 unit/kg/hour Titrate to target antiXa every 4 hours
		25,000 units/50 mL (500 units/mL)	Dilute 25,000 units to a total volume of 50 mL Use pre-made syringe if available			

Heparinised Saline for arterial lines – See *Arterial Heparinised Saline* (page 17)

Heparinised Saline for pulmonary artery lines – See *PA Heparinised Saline* (page 56)

Heparinised Saline for venous lines – See *Venous Heparinised Saline* (page 74)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
hydrALAZINE	Syringe pump	20 mg/50 mL (0.4 mg/mL)	Dilute 20 mg to a total volume of 50 mL	Sodium Chloride 0.9%, Hartmann's	12.5 to 50 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Extravasation caution • Reference 	
	Large volume pump	40 mg/100 mL (0.4 mg/mL)	Dilute 40 mg to a total volume of 100 mL	Sodium Chloride 0.9%, Hartmann's	12.5 to 50 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Extravasation caution • Reference 	
HYDROmorphine	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	Initial rate: 2 to 5 microg/kg/hour Titrate to effect up to 12 microg/kg/hour Bolus: 1 microg/kg	<ul style="list-style-type: none"> • Respiratory rate monitoring • BP monitoring • Reference 	
Hypertonic Saline – See Sodium Chloride 3% (page 69)							
INSULIN	Insulin (Actrapid®)	Syringe pump	50 units/50 mL (1 unit/mL)	Dilute 50 units to a total of 50 mL	Sodium Chloride 0.9%, Glucose 5%, Glucose 10%	0.05 to 0.1 unit/kg/hour	<ul style="list-style-type: none"> • Kept in fridge • Blood glucose monitoring • Electrolyte monitoring • Reference

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
ISOPRENALINE	Isoprenaline Less than 10 kg	Syringe pump	1 mg/50 mL (20 microg/mL)	Dilute 1 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.05 to 0.5 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Isoprenaline 10 kg and above	Syringe pump	3 mg/50 mL (60 microg/mL)	Dilute 3 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.5 to 10 microg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Isoprenaline 10 kg and above	Large volume pump	6 mg/100 mL (60 microg/mL)	Dilute 6 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.5 to 10 microg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
KETAMINE	Ketamine Less than 30 kg <i>Standard concentration</i>	Syringe pump	200 mg/50 mL (4 mg/mL)	Dilute 200 mg to a total of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Analgesia: 1 to 5 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Cardiac and Respiratory rate monitoring • Extravasation caution • Reference
						Sedation and Asthma: 1 to 20 microg/kg/min Titrate to effect	
						Bolus: 100 microg/kg	
Ketamine – continued on next page (page 37)							

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Ketamine Less than 30 kg <i>Consider for fluid restricted patients</i>	Syringe pump	400 mg/50 mL (8 mg/mL)	Dilute 400 mg to a total of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Analgesia: 1 to 5 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Cardiac and Respiratory rate monitoring • Extravasation caution • Reference
					Sedation and Asthma: 1 to 20 microg/kg/min Titrate to effect	
					Bolus: 100 microg/kg	
Ketamine 30 kg and above <i>Standard concentration</i>	Syringe pump	200 mg/50 mL (4 mg/mL)	Dilute 200 mg to a total of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Analgesia and Opioid Tolerance: 2 to 8 mg/hour Titrate to effect	<ul style="list-style-type: none"> • Cardiac and Respiratory rate monitoring • Extravasation caution • Reference
					Sedation: 6 to 30 mg/hour Titrate to effect	
					Bolus: 5 mg	
Ketamine 30 kg and above <i>Consider for fluid restricted patients</i>	Syringe pump	400 mg/50 mL (8 mg/mL)	Dilute 400 mg to a total of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Analgesia and Opioid Tolerance: 2 to 8 mg/hour Titrate to effect	<ul style="list-style-type: none"> • Cardiac and Respiratory rate monitoring • Extravasation caution • Reference
					Sedation: 6 to 30 mg/hour Titrate to effect	
					Bolus: 5 mg	

Ketamine – continued on next page (page 38)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Ketamine 30 kg and above	Large volume pump	400 mg/100 mL (4 mg/mL)	Dilute 400 mg to a total of 100 mL	Glucose 5%, Sodium Chloride 0.9%	Analgesia and Opioid Tolerance: 2 to 8 mg/hour Titrate to effect	<ul style="list-style-type: none"> • Cardiac and Respiratory rate monitoring • Extravasation caution • Reference
					Sedation: 6 to 30 mg/hour Titrate to effect	
Bolus: 5 mg						
Ketamine STATUS <i>For use in patients with refractory status epilepticus</i>	Syringe pump	400 mg/50 mL (8 mg/mL)	Dilute 400 mg to a total of 50 mL	Sodium Chloride 0.9%, Glucose 5%	Initial bolus: 100 to 200 microg/kg Maintenance: commence at 10 microg/kg/min Every increment increase needs to be preceded by a bolus of 100 to 200 microg/kg Titrate in increments of 5 to 10 microg/kg/min every 10 minutes to effect Bolus: 100 microg/kg	<ul style="list-style-type: none"> • Cardiac and Respiratory rate monitoring • Extravasation caution • CHQ-GDL-80028 Management of Refractory Status Epilepticus in Children • Reference

L-arginine – See Arginine (page 15)

L-arginine with Sodium Benzoate – See Sodium Benzoate/L-arginine (page 67)

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
LABETALOL	Labetalol	Syringe pump	100 mg/20 mL (5 mg/mL)	Undiluted Draw up 100 mg to a total volume of 20 mL	—	0.25 to 1 mg/kg/hour Titrate in increments of 0.1 to 0.25 mg/kg/hour every 15 minutes to effect Bolus: 0.25 mg/kg	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Taper infusion slowly when discontinuing treatment • Reference
	Labetalol <i>Consider for patients 70 kg and above</i>	Large volume pump	500 mg/100 mL (5 mg/mL)	Undiluted Draw up 500 mg to a total volume of 100 mL	—	0.25 to 1 mg/kg/hour Titrate in increments of 0.1 to 0.25 mg/kg/hour every 15 minutes to effect Bolus: 0.25 mg/kg	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Taper infusion slowly when discontinuing treatment • Reference
LA HEP SALINE	LA Heparinised Saline <i>For patients with left atrial line</i>	Syringe pump	100 units/50 mL (2 units/mL)	Draw up 100 units to a total volume of 50 mL <i>Use pre-made bag if available</i>	Sodium Chloride 0.9%	1 to 2 mL/hour	<ul style="list-style-type: none"> • Use syringe driver rather than pressure bag
	Levocarnitine	Syringe pump	1,000 mg/50 mL (20 mg/mL)	Dilute 1,000 mg to a total volume of 50 mL	Glucose 10%, Glucose 5%, Sodium Chloride 0.9%, Hartmann's	Load: 50 to 100 mg/kg over 30 minutes Maintenance: 4 mg/kg/hour	<ul style="list-style-type: none"> • <i>Metabolic specialist advice required</i> • SAS • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
LEVOSIMENDAN Levosimendan <i>Consider for patients 45 kg and above</i>	Syringe pump	2.5 mg/50 mL (50 microg/mL)	Dilute 2.5 mg to a total volume of 50 mL Prepare total 24 hour dose	Glucose 5%	Load: 12.5 microg/kg over 10 minutes	<ul style="list-style-type: none"> • Central line preferred • Kept in fridge • BP and Cardiac monitoring • SAS • CHQ-PMG-01459 Levosimendan • Reference
					Maintenance: 0.2 microg/kg/min for 24 hours; dose may be reduced if not tolerated	
LEVOSIMENDAN Levosimendan <i>Consider for patients 45 kg and above</i>	Large volume pump	12.5 mg/250 mL (50 microg/mL)	Dilute 12.5 mg to a total volume of 250 mL	Glucose 5%	Load: 12.5 microg/kg over 10 minutes	<ul style="list-style-type: none"> • Central line preferred • Kept in fridge • BP and Cardiac monitoring • SAS • CHQ-PMG-01459 Levosimendan • Reference
					Maintenance: 0.2 microg/kg/min for 24 hours; dose may be reduced if not tolerated	

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
LIDOCAINE	Lidocaine (Lignocaine)	Syringe pump	200 mg/50 mL (4 mg/mL)	Dilute 200 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	<u>Arrhythmias:</u> Load: 0.5 to 1 mg/kg over 2 minutes Maintenance: 0.6 to 3 mg/kg/hour	<ul style="list-style-type: none"> • BP and Cardiac monitoring • ECG monitoring • CHQ-GDL-01458 Common arrhythmias and their management in the PICU • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference
						<u>Refractory Status Epilepticus:</u> Load: 1 to 3 mg/kg over 2 minutes Maintenance: 1 to 6 mg/kg/hour	
LIOTHYRONINE	Liothyronine	Syringe pump	20 microg/50 mL (0.4 microg/mL)	Dilute 20 microg to total volume of 50 mL <i>Use equal parts Sodium Chloride 0.9% and Albumin 4% for dilution</i>	Sodium Chloride 0.9% and Albumin 4%	0.1 to 0.15 microg/kg/hour	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference

Lipid Emulsion for local anaesthetic toxicity – See TOX Lipid 20% TOX (page 72)

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
LORazepam	LORazepam	Syringe pump	4 mg/50 mL (80 microg/mL)	Dilute 4 mg to a total volume of 50 mL <i>Invert to mix, do not shake</i>	Glucose 5%, Sodium Chloride 0.9%	25 to 50 microg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • <i>Specialist advice required</i> • Kept in fridge • Midazolam is preferred due to propylene glycol accumulation • Respiratory rate monitoring • Extravasation caution • SAS • Reference
						Bolus: 50 microg/kg	
MAGNESIUM SULFATE	Magnesium Sulfate	Syringe pump	25 mmol/50 mL (0.5 mmol/mL)	Dilute 25 mmol to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.08 to 0.3 mmol/kg/hour	<ul style="list-style-type: none"> • BP monitoring • Monitor serum magnesium • CHQ-PMG 01246 Magnesium Sulfate Intravenous • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference
	Magnesium Sulfate <i>Consider for patients 45 kg and above</i>	Large volume pump	50 mmol/100 mL (0.5 mmol/mL)	Dilute 50 mmol to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.08 to 0.3 mmol/kg/hour	<ul style="list-style-type: none"> • BP monitoring • Monitor serum magnesium • CHQ-PMG 01246 Magnesium Sulfate Intravenous • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
METARAMINOL	Metaraminol <i>Standard concentration</i>	Syringe pump 2 mg/50 mL (0.04 mg/mL)	Dilute 2 mg to a total volume of 50 mL <i>Do NOT place prefilled syringes in pumps</i>	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.05 to 0.5 microg/kg/min Titrate in increments of 0.05 microg/kg/min every 5 minutes to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Metaraminol <i>Consider for fluid restricted patients</i>	Large volume pump 20 mg/100 mL (0.2 mg/mL)	Dilute 20 mg to a total volume of 100 mL <i>Do NOT place prefilled syringes in pumps</i>	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.05 to 0.5 microg/kg/min Titrate in increments of 0.05 microg/kg/min every 5 minutes to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
methADONe	methADONe	Syringe pump 100 mg/50 mL (2 mg/mL)	Dilute 100 mg to a total volume of 50 mL	Sodium Chloride 0.9%	0.01 to 0.1 mg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • <i>Specialist advice required</i> • BP, Cardiac and Respiratory rate monitoring • Reference
METHYLENE BLUE	Methylene Blue (Methylthioninium)	Syringe pump 50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%	0.25 mg/kg/hour	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Methylene Blue (Methylthioninium)	Large volume pump 100 mg/100 mL (1 mg/mL)	Dilute 100 mg to a total volume of 100 mL	Glucose 5%	0.25 mg/kg/hour	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
METOPROLOL	Metoprolol	Syringe pump	20 mg/50 mL (0.4 mg/mL)	Dilute 20 mg to a total volume of 50 mL	Glucose 5% Sodium Chloride 0.9%	<p>Load: 0.1 mg/kg up to a maximum of 5 mg; repeat every 5 minutes for a maximum of 3 doses</p> <p>Maintenance: 0.5 to 5 microg/kg/min</p> <p>Titrate in increments of 0.5 microg/kg/min every 30 minutes to effect</p> <p>(Maximum 110 microg/min)</p>	<ul style="list-style-type: none"> • BP and Cardiac monitoring • ECG monitoring • Reference
	Metoprolol <i>Consider for patients 45 kg and above</i>	Large volume pump	40 mg/100 mL (0.4 mg/mL)	Dilute 40 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	<p>Load: 0.1 mg/kg up to a maximum of 5 mg; repeat every 5 minutes for a maximum of 3 doses</p> <p>Maintenance: 0.5 to 5 microg/kg/min</p> <p>Titrate in increments of 0.5 microg/kg/min every 30 minutes to effect</p> <p>(Maximum 110 microg/min)</p>	<ul style="list-style-type: none"> • BP and Cardiac monitoring • ECG monitoring • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
MIDAZOLAM	Midazolam <i>Standard concentration</i>	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	<p>Less than 6 months: 10 to 60 microg/kg/hour; titrate to effect</p> <p>6 months or above: 10 to 120 microg/kg/hour; titrate to effect</p> <hr/> <p>Bolus: 20 microg/kg</p>	<ul style="list-style-type: none"> • BP and Respiratory rate monitoring • Extravasation caution • Reference
	Midazolam <i>Consider for fluid restricted patients</i>	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	<p>Less than 6 months: 10 to 60 microg/kg/hour; titrate to effect</p> <p>6 months or above: 10 to 120 microg/kg/hour; titrate to effect</p> <hr/> <p>Bolus: 20 microg/kg</p>	<ul style="list-style-type: none"> • BP and Respiratory rate monitoring • Extravasation caution • Reference
	Midazolam 70 kg and above	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	<p>1 to 8 mg/hour Titrate to effect</p> <hr/> <p>Bolus: 1 mg</p>	<ul style="list-style-type: none"> • BP and Respiratory rate monitoring • Extravasation caution • Reference

Midazolam – continued on next page (page 46)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
MIDAZOLAM	Midazolam 70 kg and above	Large volume pump	100 mg/100 mL (1 mg/mL)	Dilute 100 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	1 to 8 mg/hour Titrate to effect Bolus: 1 mg	<ul style="list-style-type: none"> • BP and Respiratory rate monitoring • Extravasation caution • Reference
	Midazolam STATUS <i>Standard concentration</i>	Syringe pump	60 mg/50 mL (1.2 mg/mL)	Dilute 60 mg to a total volume of 50 mL	Sodium Chloride 0.9%, Glucose 5%, Glucose 10%	100 to 400 microg/kg/hour Titrate in increments of 100 microg/kg/hour every 5 minutes to effect Bolus: 100 microg/kg	<ul style="list-style-type: none"> • BP and Respiratory rate monitoring • Extravasation caution • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference
	Midazolam STATUS <i>Consider for fluid restricted patients</i>	Large volume pump	250 mg/100 mL (2.5 mg/mL)	Dilute 250 mg to a total volume of 100 mL	Sodium Chloride 0.9%, Glucose 5%, Glucose 10%	100 to 400 microg/kg/hour Titrate in increments of 100 microg/kg/hour every 5 minutes to effect Bolus: 100 microg/kg	<ul style="list-style-type: none"> • BP and Respiratory rate monitoring • Extravasation caution • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
MILRINONE	Milrinone <i>Standard concentration</i>	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.2 to 0.75 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Milrinone <i>Consider for fluid restricted patients</i>	Syringe pump	20 mg/50 mL (0.4 mg/mL)	Dilute 20 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.2 to 0.75 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Milrinone	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Dilute 20 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	0.2 to 0.75 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
MORPHINE	Morphine <i>Standard concentration</i>	Syringe pump	5 mg/50 mL (0.1 mg/mL)	Dilute 5 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	5 to 60 microg/kg/hour Titrate to effect Bolus: 20 microg/kg	<ul style="list-style-type: none"> • Respiratory rate monitoring • Reference
	Morphine <i>Consider for fluid restricted patients</i>	Syringe pump	30 mg/50 mL (0.6 mg/mL)	Dilute 30 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	5 to 60 microg/kg/hour Titrate to effect Bolus: 20 microg/kg	<ul style="list-style-type: none"> • Respiratory rate monitoring • Reference
	Morphine <i>Consider for fluid restricted patients on high doses</i>	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	5 to 60 microg/kg/hour Titrate to effect Bolus: 20 microg/kg	<ul style="list-style-type: none"> • Respiratory rate monitoring • Reference

N-Acetylcysteine (NAC) – See *Acetylcysteine* (page 10)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Naloxone	Syringe pump	200 microg/50 mL (4 microg/mL)	Dilute 200 microg to a total of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Opioid-induced itch: 0.5 to 2 microg/kg/hour Titrate in increments of 0.5 microg/kg/hour every 2 hours to effect	<ul style="list-style-type: none"> • Monitor for opioid withdrawal • Reference
					Opioid overdose (full reversal): 10 to 40 microg/kg/hour Titrate to effect	
					Bolus: 1 microg/kg	
NESIRITIDE	Nesiritide <i>Standard concentration</i>	150 microg/50 mL (3 microg/mL)	Dilute 150 microg to a total volume of 50 mL <i>Do not shake, rotate vial gently to dissolve powder</i>	Glucose 5%, Sodium Chloride 0.9%	0.01 to 0.03 microg/kg/min Titrate in increments of 0.005 microg/kg/min every 3 hours to effect	<ul style="list-style-type: none"> • BP monitoring • SAS • Reference
	Nesiritide <i>Consider for fluid restricted patients</i>	1,500 microg/250 mL (6 microg/mL)	Dilute 1,500 microg to a total volume of 250 mL <i>Do not shake, rotate vial gently to dissolve powder</i>	Glucose 5%, Sodium Chloride 0.9%	0.01 to 0.03 microg/kg/min Titrate in increments of 0.005 microg/kg/min every 3 hours to effect	<ul style="list-style-type: none"> • BP monitoring • SAS • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
niCARDipine	niCARDipine	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.5 to 4 microg/kg/min up to maximum of 5 mg/hour Titrate in increments of 0.5 microg/kg/min every 15 minutes to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • SAS • Reference
	niCARDipine	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Dilute 20 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	0.5 to 4 microg/kg/min up to maximum of 5 mg/hour Titrate in increments of 0.5 microg/kg/min every 15 minutes to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • SAS • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
niMODIPine	niMODIPine 35 kg and less	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Undiluted Draw up 10 mg to a total volume of 50 mL <i>Use non-PVC syringe and lines if available</i> <i>Protect infusion from light</i>	**Complex administration; refer to AIDH** Y-site only: Sodium Chloride 0.9%, Glucose 5%, Hartmann's	Initial rate: 15 microg/kg/hour If tolerated, increase after 2 hours to 30 microg/kg/hour	<ul style="list-style-type: none"> • Central access required • BP monitoring • Solution contains alcohol 23.7% (23.7 gram/100 mL) • Reference
	niMODIPine 35 kg and less	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Undiluted Draw up 20 mg to a total volume of 100 mL <i>Use non-PVC tubing and empty bags</i> <i>Protect infusion from light</i>	**Complex administration; refer to AIDH** Y-site only: Sodium Chloride 0.9%, Glucose 5%, Hartmann's	Initial rate: 15 microg/kg/hour If tolerated, increase after 2 hours to 30 microg/kg/hour	<ul style="list-style-type: none"> • Central access required • BP monitoring • Solution contains alcohol 23.7% (23.7 gram/100 mL) • Reference

niMODIPine – continued on next page (page 52)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
niMODIPine	niMODIPine Above 35 kg and less than 70 kg	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Undiluted Draw up 10 mg to a total volume of 50 mL <i>Use non-PVC syringe and lines if available</i> <i>Protect infusion from light</i>	**Complex administration; refer to AIDH** Y-site only: Sodium Chloride 0.9%, Glucose 5%, Hartmann's	Initial rate: 0.5 mg/hour If tolerated, increase after 2 hours to 1 mg/hour	<ul style="list-style-type: none"> • Central access required • BP monitoring • Solution contains alcohol 23.7% (23.7 gram/100 mL) • Reference
	niMODIPine Above 35 kg and less than 70 kg	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Undiluted Draw up 20 mg to a total volume of 100 mL <i>Use non-PVC tubing and empty bags</i> <i>Protect infusion from light</i>	**Complex administration; refer to AIDH** Y-site only: Sodium Chloride 0.9%, Glucose 5%, Hartmann's	Initial rate: 0.5 mg/hour If tolerated, increase after 2 hours to 1 mg/hour	<ul style="list-style-type: none"> • Central access required • BP monitoring • Solution contains alcohol 23.7% (23.7 gram/100 mL) • Reference

niMODIPine – continued on next page (page 53)

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
niMODIPine	niMODIPine 70 kg and above	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Undiluted Draw up 10 mg to a total volume of 50 mL <i>Use non-PVC syringe and lines if available</i> <i>Protect infusion from light</i>	**Complex administration; refer to AIDH** Y-site only: Sodium Chloride 0.9%, Glucose 5%, Hartmann's	Initial rate: 1 mg/hour If tolerated, increase after 2 hours to 2 mg/hour	<ul style="list-style-type: none"> • Central access required • BP monitoring • Solution contains alcohol 23.7% (23.7 gram/100 mL) • Reference
	niMODIPine 70 kg and above	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Undiluted Draw up 20 mg to a total volume of 100 mL <i>Use non-PVC tubing and empty bags</i> <i>Protect infusion from light</i>	**Complex administration; refer to AIDH** Y-site only: Sodium Chloride 0.9%, Glucose 5%, Hartmann's	Initial rate: 1 mg/hour If tolerated, increase after 2 hours to 2 mg/hour	<ul style="list-style-type: none"> • Central access required • BP monitoring • Solution contains alcohol 23.7% (23.7 gram/100 mL) • Reference

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
NORADRENALINE	Noradrenaline (Norepinephrine) <i>Standard concentration</i>	Syringe pump	1 mg/50 mL (0.02 mg/mL)	Dilute 1 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%*	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Noradrenaline (Norepinephrine) <i>Consider for fluid restricted patients</i>	Syringe pump	4 mg/50 mL (0.08 mg/mL)	Dilute 4 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%*	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference
	Noradrenaline (Norepinephrine) <i>Standard concentration</i>	Large volume pump	4 mg/100 mL (0.04 mg/mL)	Dilute 4 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%*	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Noradrenaline (Norepinephrine) <i>Consider for fluid restricted patients</i>	Large volume pump	12 mg/100 mL (0.12 mg/mL)	Dilute 12 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%*	0.05 to 0.2 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • Central access required • BP and Cardiac monitoring • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
Octreotide	Syringe pump	500 microg/10 mL (50 microg/mL)	Dilute 500 microg to a total volume of 10 mL	Sodium Chloride 0.9% Glucose 5%	Oesophageal varices and bleeding: 1 to 2 microg/kg/hour (Maximum 50 microg/hour)	<ul style="list-style-type: none"> Kept in fridge Blood glucose monitoring Taper infusion slowly when discontinuing treatment Reference 	
					Chylothorax: 3 to 4 microg/kg/hour (Maximum 200 microg/hour) Titrate to effect		
OMEPRAZOLE	Omeprazole	Syringe pump	40 mg/50 mL (0.8 mg/mL)	Dilute 40 mg to a total volume of 50 mL <i>Replace infusion every 12 hours</i>	Sodium Chloride 0.9% Glucose 5%	0.1 to 0.2 mg/kg/hour up to a maximum of 8 mg/hour	<ul style="list-style-type: none"> Extravasation caution Reference
	Omeprazole	Large volume pump	80 mg/100 mL (0.8 mg/mL)	Dilute 80 mg to a total volume of 100 mL <i>Replace infusion every 12 hours</i>	Sodium Chloride 0.9% Glucose 5%	0.1 to 0.2 mg/kg/hour up to a maximum of 8 mg/hour	<ul style="list-style-type: none"> Extravasation caution Reference

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
oxyCODONE	oxyCODONE <i>Standard concentration</i>	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	1 to 40 microg/kg/hour Titrate to effect Bolus: 20 microg/kg	<ul style="list-style-type: none"> • <i>Pain specialist review required</i> • Respiratory rate monitoring • Reference
	oxyCODONE <i>Consider for fluid restricted patients</i>	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	1 to 40 microg/kg/hour Titrate to effect Bolus: 20 microg/kg	<ul style="list-style-type: none"> • <i>Pain specialist review required</i> • Respiratory rate monitoring • Reference
PA HEP SALINE	PA Heparinised Saline <i>For patients with pulmonary artery line</i>	Syringe pump	100 units/50 mL (2 units/mL)	Draw up 100 units to a total volume of 50 mL <i>Use pre-made bag if available</i>	Sodium Chloride 0.9%	1 to 2 mL/hour	<ul style="list-style-type: none"> • Use syringe driver rather than pressure bag
PANTOPRAZOLE	Pantoprazole	Syringe pump	40 mg/50 mL (0.8 mg/mL)	Dilute 40 mg to a total volume of 50 mL <i>Replace infusion every 12 hours</i>	Glucose 5%, Sodium Chloride 0.9%	0.1 to 0.2 mg/kg/hour up to a maximum of 8 mg/hour	<ul style="list-style-type: none"> • Extravasation caution • Reference
	Pantoprazole	Large volume pump	80 mg/100 mL (0.8 mg/mL)	Dilute 80 mg to a total volume of 100 mL <i>Replace infusion every 12 hours</i>	Glucose 5%, Sodium Chloride 0.9%	0.1 to 0.2 mg/kg/hour up to a maximum of 8 mg/hour	<ul style="list-style-type: none"> • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
PHENTOLAMINE	Phentolamine	Syringe pump	100 mg/50 mL (2 mg/mL)	Dilute 100 mg to a total volume of 50 mL	Sodium Chloride 0.9%	Initial rate: 5 to 10 microg/kg/min <i>(Maximum initial rate 40 mg/hour)</i> Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference
	Phentolamine <i>Consider for patients 70 kg and above</i>	Large volume pump	200 mg/100 mL (2 mg/mL)	Dilute 200 mg to a total volume of 100 mL	Sodium Chloride 0.9%	Initial rate: 5 to 10 microg/kg/min <i>(Maximum initial rate 40 mg/hour)</i> Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference
PHENYLEPHRINE	Phenylephrine	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.1 to 0.5 microg/kg/min Titrate to effect Bolus: 2 microg/kg	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference
	Phenylephrine	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Dilute 20 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	0.1 to 0.5 microg/kg/min Titrate to effect Bolus: 2 microg/kg	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Phosphate (Sodium Dihydrogen Phosphate)	Syringe pump OR Large volume pump	Variable	Peripheral line: Dilute exact dose to 0.05 mmol/mL or weaker	Glucose 5%, Sodium Chloride 0.9%	Initial rate: 0.05 mmol/kg/hour Titrate to target phosphate levels, up to a maximum of 0.2 mmol/kg/hour	<ul style="list-style-type: none"> • Electrolyte monitoring • BP and Cardiac monitoring when infused at rate greater than 0.06 mmol/kg/hour • Extravasation caution • Reference
			Central line: Dilute exact dose to 0.12 mmol/mL or weaker			

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
POTASSIUM CHLORIDE	Potassium Chloride Less than 50 kg <i>High concentration</i>	Syringe pump	20 mmol/20 mL (1 mmol/mL)	Undiluted Draw up 20 mmol to a total volume of 20 mL	—	0.1 to 0.3 mmol/kg/hour up to a maximum of 20 mmol/hour Titrate to target potassium levels	<ul style="list-style-type: none"> • Central access required • Monitoring serum potassium • BP and Cardiac monitoring • Extravasation caution • CHQ-PMG-01213 Potassium for Paediatric Patients – oral and intravenous • Reference
	Potassium Chloride 50 kg and above <i>High concentration</i>	Syringe pump	40 mmol/40 mL (1 mmol/mL)	Undiluted Draw up 40 mmol to a total volume of 40 mL	—	0.1 to 0.3 mmol/kg/hour up to a maximum of 20 mmol/hour Titrate to target potassium levels	<ul style="list-style-type: none"> • Central access required • Monitoring serum potassium • BP and Cardiac monitoring • Extravasation caution • CHQ-PMG-01213 Potassium for Paediatric Patients – oral and intravenous • Reference

Potassium Chloride – continued on next page (page 60)

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
POTASSIUM CHLORIDE	Potassium Chloride <i>Standard concentration</i>	Large volume pump	10 mmol/100 mL (0.1 mmol/mL)	Undiluted <i>Use the 10 mmol potassium chloride in 100 mL sodium chloride 0.29% pre-made bag</i>	—	0.1 to 0.3 mmol/kg/hour up to a maximum of 20 mmol/hour Titrate to target potassium levels	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Monitoring serum potassium • Extravasation caution • CHQ-PMG-01213 Potassium for Paediatric Patients – oral and intravenous • Reference
	Potassium Chloride <i>Consider for fluid restricted patients</i>	Large volume pump	40 mmol/100 mL (0.4 mmol/mL)	Undiluted <i>Use the 40 mmol potassium chloride in 100 mL sodium chloride 0.9% pre-made bag</i>	—	0.1 to 0.3 mmol/kg/hour up to a maximum of 20 mmol/hour Titrate to target potassium levels	<ul style="list-style-type: none"> • Central access required • Monitoring serum potassium • BP and Cardiac monitoring • Extravasation caution • CHQ-PMG-01213 Potassium for Paediatric Patients – oral and intravenous • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
PRALIDOXIME	Pralidoxime	Syringe pump	1,000 mg/50 mL (20 mg/mL)	Dilute 1,000 mg to a total volume of 50 mL	Sodium Chloride 0.9%	Load: 15 mg/kg up to a maximum of 1,000 mg over 15 minutes	<ul style="list-style-type: none"> • <i>Toxicologist advice required</i> • SAS • Reference
						Maintenance: 10 mg/kg/hour up to a maximum of 250 mg/hour	
	Pralidoxime	Large volume pump	2,000 mg/100 mL (20 mg/mL)	Dilute 2,000 mg to a total volume of 100 mL	Sodium Chloride 0.9%	Load: 15 mg/kg up to a maximum of 1,000 mg over 15 minutes	
						Maintenance: 10 mg/kg/hour up to a maximum of 250 mg/hour	

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
PROCAINAMIDE	Procainamide	Syringe pump	200 mg/50 mL (4 mg/mL)	Dilute 200 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	<p>Load: 5 mg/kg up to a maximum of 100 mg over 10 minutes</p> <p>Maintenance: 20 to 80 microg/kg/min up to a maximum of 4,000 microg/min</p> <p>Titrate to effect</p>	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference
	Procainamide	Large volume pump	1000 mg/250 mL (4 mg/mL)	Dilute 1,000 mg to a total volume of 250 mL	Glucose 5%, Sodium Chloride 0.9%	<p>Load: 5 mg/kg up to a maximum of 100 mg over 10 minutes</p> <p>Maintenance: 20 to 80 microg/kg/min up to a maximum of 4,000 microg/min</p> <p>Titrate to effect</p>	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
propOFol	Syringe pump	500 mg/50 mL (10 mg/mL)	Undiluted Draw up 500 mg to a total volume of 50 mL <i>Replace infusion every 12 hours</i>	—	0.3 to 3 mg/kg/hour up to a maximum of 200 mg/hour Titrate to effect	<ul style="list-style-type: none"> • BP, Cardiac and Respiratory rate monitoring • Reference
					Bolus: 0.5 mg/kg Cumulative bolus and infusion dose must not exceed 4 mg/kg/hour	
propOFol	Large volume pump	1,000 mg/100 mL (10 mg/mL)	Undiluted <i>Use the 1,000 mg in 100 mL pre-made vial</i> <i>Replace infusion every 12 hours</i>	—	0.3 to 3 mg/kg/hour up to a maximum of 200 mg/hour Titrate to effect	<ul style="list-style-type: none"> • BP, Cardiac and Respiratory rate monitoring • Reference
					Bolus: 0.5 mg/kg Cumulative bolus and infusion dose must not exceed 4 mg/kg/hour	
Prostin – See Alprostadil (page 12)						

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
REMIFENTANIL	Remifentanil <i>Standard concentration</i>	Syringe pump	2 mg/50 mL (0.04 mg/mL)	Dilute 2 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.05 to 0.3 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • BP, Cardiac and Respiratory rate monitoring • Do not flush after administration as may cause respiratory depression • Reference
						Bolus: 0.1 microg/kg	
	Remifentanil <i>Consider for fluid restricted patients</i>	Syringe pump	5 mg/50 mL (0.1 mg/mL)	Dilute 5 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.05 to 0.3 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • BP, Cardiac and Respiratory rate monitoring • Do not flush after administration as may cause respiratory depression • Reference
						Bolus: 0.1 microg/kg	
	Remifentanil	Large volume pump	20 mg/100 mL (0.2 mg/mL)	Dilute 20 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	0.05 to 0.3 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • BP, Cardiac and Respiratory rate monitoring • Do not flush after administration as may cause respiratory depression • Reference
						Bolus: 0.1 microg/kg	

	Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
ROCURONIUM	Rocuronium <i>Standard concentration</i>	Syringe pump	100 mg/50 mL (2 mg/mL)	Dilute 100 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	5 to 10 microg/kg/min Titrate to effect Target Train of Four 2 /4 Bolus: 100 microg/kg	<ul style="list-style-type: none"> • Kept in fridge • Ventilatory support required • Train of Four monitoring [CHQ-WI-80106] • Reversed by sugammadex • Extravasation caution • Reference
	Rocuronium <i>Consider for fluid restricted patients</i>	Syringe pump	250 mg/50 mL (5 mg/mL)	Dilute 250 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Hartmann's	5 to 10 microg/kg/min Titrate to effect Target Train of Four 2 /4 Bolus: 100 microg/kg	<ul style="list-style-type: none"> • Kept in fridge • Ventilatory support required • Train of Four monitoring [CHQ-WI-80106] • Reversed by sugammadex • Extravasation caution • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Salbutamol	Syringe pump	50 mg/50 mL (1 mg/mL)	Undiluted Draw up 50 mg to a total volume of 50 mL	—	<p>Load: 5 microg/kg/min for 20 minutes</p> <p>Maintenance: 1 to 2 microg/kg/min Titrate to effect</p>	<ul style="list-style-type: none"> • Central line preferred • BP and heart rate monitoring • Blood glucose monitoring • Monitor serum lactate and potassium • CHQ-GDL-80112 Management of Severe Acute and Life-Threatening Asthma in PICU • Reference
Sodium Benzoate <i>Ensure loading dose is given prior to commencing infusion</i>	Large volume pump	7,500 mg/150 mL (50 mg/mL)	Dilute 7,500 mg to a total volume of 150 mL	Glucose 10%, Glucose 5%	10.4 mg/kg/hour (usual maximum 12 gram/day)	<ul style="list-style-type: none"> • <i>Metabolic Specialist advice required</i> • Central access preferred • Extravasation caution • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
SODIUM BENZOATE/L-ARGININE	Sodium Benzoate/ L-arginine <i>Ensure loading dose is given prior to commencing infusion</i>	Syringe pump	Sodium benzoate 50 mg/mL L-arginine 42 mg/mL	Dilute 2,500 mg of Sodium Benzoate, and 2,100 mg of L-arginine to a total volume of 50 mL **Complex administration; refer to Policy** <i>Dose in DERS reflects Sodium Benzoate component</i>	Glucose 10%	Sodium benzoate: 10.4 mg/kg/hour (usual maximum 12 gram/day) L-arginine: 8.75 mg/kg/hour (usual maximum 10 gram/day)	<ul style="list-style-type: none"> • <i>Metabolic Specialist advice required</i> • Central access preferred • Observe for anaphylaxis • Extravasation caution • CHQ-GDL-04313 Administration of Intravenous SODIUM BENZOATE and L-ARGININE HYDROCHLORIDE in children with hyperammonaemia associated with a urea cycle defect • Reference
	Sodium Benzoate/ L-arginine <i>Ensure loading dose is given prior to commencing infusion</i>	Large volume pump	Sodium benzoate 50 mg/mL L-arginine 42 mg/mL	Dilute 6,000 mg of Sodium Benzoate, and 5,040 mg of L-arginine to a total volume of 120 mL **Complex administration; refer to Policy** <i>Dose in DERS reflects Sodium Benzoate component</i>	Glucose 10%	Sodium benzoate: 10.4 mg/kg/hour (usual maximum 12 gram/day) L-arginine: 8.75 mg/kg/hour (usual maximum 10 gram/day)	<ul style="list-style-type: none"> • <i>Metabolic Specialist advice required</i> • Central access preferred • Observe for anaphylaxis • Extravasation caution • CHQ-GDL-04313 Administration of Intravenous SODIUM BENZOATE and L-ARGININE HYDROCHLORIDE in children with hyperammonaemia associated with a urea cycle defect • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
SODIUM BICARBONATE	Sodium Bicarbonate <i>For ALL patients with peripheral access</i>	Syringe pump	5 mmol/50 mL (0.1 mmol/mL)	Dilute 5 mmol to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.25 to 1 mmol/kg/hour	<ul style="list-style-type: none"> • Peripheral line • Electrolyte monitoring • Extravasation caution • Reference
	Sodium Bicarbonate Less than 2 years	Syringe pump	25 mmol/50 mL (0.5 mmol/mL)	Dilute 25 mmol to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.25 to 1 mmol/kg/hour	<ul style="list-style-type: none"> • Central access required • Electrolyte monitoring • Extravasation caution • Reference
	Sodium Bicarbonate 2 years and above	Syringe pump	50 mmol/50 mL (1 mmol/mL)	Undiluted Draw up 50 mmol to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.25 to 1 mmol/kg/hour	<ul style="list-style-type: none"> • Central access required • Electrolyte monitoring • Extravasation caution • Reference
	Sodium Bicarbonate 2 years and above	Large volume pump	100 mmol/100 mL (1 mmol/mL)	Undiluted Draw up 100 mmol to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%, Glucose 10%	0.25 to 1 mmol/kg/hour	<ul style="list-style-type: none"> • Central access required • Electrolyte monitoring • Extravasation caution • Reference

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
SODIUM CHLORIDE 3%	Sodium Chloride 3%	Syringe pump	25 mmol/50 mL (0.5 mmol/mL)	Undiluted Draw up 50 mL of sodium chloride 3% solution <i>Use pre-made bag</i>	—	Severe hyponatraemia: 0.05 to 0.25 mmol/kg/hour Titrate to target sodium level Rates over 0.25 mmol/kg/hour can be used for symptom management Following resolution of symptoms, maintenance infusion should not exceed 0.25 mmol/kg/hour	<u>Severe hyponatraemia:</u> <ul style="list-style-type: none"> • Central access preferred • Monitor serum sodium level • CHQ-GDL-04112 • Extravasation caution • Reference <u>ICP control:</u> <ul style="list-style-type: none"> • Central access preferred • Monitor ICP and serum sodium level • CHQ-GDL-80114 • Extravasation caution • Reference
	Sodium Chloride 3%	Large volume pump	125 mmol/250 mL (0.5 mmol/mL)	Undiluted Prepare 125 mmol in a total volume of 250 mL <i>Use pre-made bag</i>	—	ICP control: 0.05 to 0.5 mmol/kg/hour Titrate to target ICP For rapid control of ICP: 1 to 2.5 mmol/kg (= 2 to 5 mL/kg) over 10 to 20 minutes For refractory ICP: refer to sodium chloride 23.4%	
Sodium Dihydrogen Phosphate – See Phosphate (page 58)							

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
SODIUM nitroPRUSSide	Sodium nitroPRUSSide <i>Standard concentration</i>	Syringe pump	10 mg/50 mL (0.2 mg/mL)	Dilute 10 mg to a total volume of 50 mL <i>Protect infusion from light</i>	Glucose 5%	0.2 to 4 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Monitor for cyanide toxicity • Extravasation caution • Reference
	Sodium nitroPRUSSide <i>Consider for fluid restricted patients</i>	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL <i>Protect infusion from light</i>	Glucose 5%	0.2 to 4 microg/kg/min Titrate to effect	<ul style="list-style-type: none"> • BP and Cardiac monitoring • Monitor for cyanide toxicity • Extravasation caution • Reference
SODIUM THIOSULFATE	Sodium Thiosulfate <i>For cyanide toxicity</i>	Syringe pump	500 mg/50 mL (10 mg/mL)	Dilute 500 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%⁸	1 to 2.4 mg/kg/hour <i>For treatment of sodium nitroprusside toxicity, infuse at 5 to 10 times the rate of sodium nitroprusside</i>	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference
	Sodium Thiosulfate <i>To prevent cisplatin toxicity</i>	Large volume pump	7,500 mg/100 mL (75 mg/mL)	Dilute 7,500 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	30 to 50 mg/kg/hour for 6 hours	<ul style="list-style-type: none"> • BP and Cardiac monitoring • SAS • Reference

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
Sodium Valproate	Syringe pump	400 mg/50 mL (8 mg/mL)	Dilute 400 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Load: 40 mg/kg over 10 minutes	<ul style="list-style-type: none"> • Therapeutic drug monitoring • Extravasation caution • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference
					Maintenance: 1 to 3 mg/kg/hour Titrate to target serum concentration	
TACrolimus	Large volume pump	2.5 mg/250 mL (10 microg/mL)	Dilute 2.5 mg to a total volume of 250 mL <i>Use non-PVC and non-DEHP bags and giving sets</i>	Sodium Chloride 0.9%, Glucose 5%	0.4 to 2 microg/kg/hour Titrate to target serum concentration	<ul style="list-style-type: none"> • Therapeutic drug monitoring • CHQ-PMG-01235 Intravenous Tacrolimus • Reference
THIOPENTAL (THIOPENTONE)	Syringe pump	470 mg/47 mL (10 mg/mL) <i>470 mg of thiopental is equivalent to 500 mg thiopental sodium</i>	Dilute 470 mg to a total volume of 47 mL	Glucose 5%, Sodium Chloride 0.9%	1 to 8 mg/kg/hour Titrate to effect	<ul style="list-style-type: none"> • Central access preferred • BP and Cardiac monitoring • Extravasation caution • CHQ-GDL-80028 Refractory Status Epilepticus Management in Children • Reference
					Bolus: 2 mg/kg	

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
TOX LIPID 20% TOX	TOX Lipid 20% TOX (Fat Emulsion 20%) <i>To be used in conjunction with Local Anaesthetic Systemic Toxicity Guideline</i>	Syringe pump	20%	Undiluted Draw up a total volume of 50 mL	—	Load: 1.5 mL/kg Repeat every 5 minutes if required to maximum 3 doses Maintenance: 15 mL/kg/hour Maximum cumulative dose including boluses is 12 mL/kg	<ul style="list-style-type: none"> • Use 1.2 micron filter and filter extension sets • CHQ-GDL-00731 Local Anaesthetic Systemic Toxicity • Reference
	TOX Lipid 20% TOX (Fat Emulsion 20%) <i>To be used in conjunction with Local Anaesthetic Systemic Toxicity Guideline</i>	Large volume pump	20%	Undiluted <i>Use pre-made bag</i>	—	Load: 1.5 mL/kg Repeat every 5 minutes if required to maximum 3 doses Maintenance: 15 mL/kg/hour Maximum cumulative dose including boluses is 12 mL/kg	

Medication		Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes
TRANEXAMIC ACID	Tranexamic Acid	Syringe pump	1,000 mg/50 mL (20 mg/mL)	Dilute 1,000 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	Load: 10 mg/kg up to a maximum of 1,000 mg over 10 min	<ul style="list-style-type: none"> • CHQ-WI-80113 PICU: Acute Bleeding Guideline • Reference
						Maintenance: 1.875 mg/kg/hour	
	Tranexamic Acid	Large volume pump	2,000 mg/100 mL (20 mg/mL)	Dilute 2,000 mg to a total volume of 100 mL	Glucose 5%, Sodium Chloride 0.9%	Load: 10 mg/kg up to a maximum of 1,000 mg over 10 min	<ul style="list-style-type: none"> • CHQ-WI-80113 PICU: Acute Bleeding Guideline • Reference
						Maintenance: 1.875 mg/kg/hour	
Triiodothyronine – See Liothyronine (page 41)							
Vancomycin	Syringe pump OR Large volume pump	Variable	<p>Peripheral line: Dilute exact dose to 5 mg/mL or weaker</p> <p>Central line: Dilute exact dose to 10 mg/mL or weaker</p>	Glucose 5%, Sodium Chloride 0.9%	Variable Titrate to target serum concentration	<ul style="list-style-type: none"> • <i>Infectious Diseases specialist advice required</i> • Rapid infusion may cause red man syndrome • Therapeutic drug monitoring • Extravasation caution • CHQ Vancomycin Therapeutic Drug Monitoring • Reference 	

Medication	Infusion device	Final infusion concentration	Preparation	Compatible fluids	Usual dose range	Special notes	
Valproate – See <i>Sodium Valproate</i> (page 71)							
Vasopressin – See <i>Argipressin</i> (page 16)							
VECURONIUM	Vecuronium Less than 20 kg	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.3 to 3 microg/kg/min Titrate to effect Target Train of Four 2 /4 Bolus: 100 microg/kg	<ul style="list-style-type: none"> • Ventilatory support required • Train of Four monitoring [CHQ-WI-80106] • Reversed by sugammadex • Extravasation caution • Reference
	Vecuronium 20 kg and above	Syringe pump	50 mg/50 mL (1 mg/mL)	Dilute 50 mg to a total volume of 50 mL	Glucose 5%, Sodium Chloride 0.9%	0.5 to 5 mg/hour Titrate to effect Target Train of Four 2 /4 Bolus: 2 to 4 mg	<ul style="list-style-type: none"> • Ventilatory support required • Train of Four monitoring [CHQ-WI-80106] • Reversed by sugammadex • Extravasation caution • Reference
VENOUS HEP SALINE	Venous Heparinised Saline	Syringe pump	100 units/50 mL (2 units/mL)	Draw up 100 units to a total volume of 50 mL <i>Use pre-made bag if available</i>	Sodium Chloride 0.9%	1 to 2 mL/hour Bolus flush: 1 to 2 mL	<ul style="list-style-type: none"> • Use syringe driver rather than pressure bag. Ensure bolus flushes are included in fluid balance

References to support medication recommendations

Medication	Usual maximum dose	Reference (refer to page 84–86)
Acetylcysteine	Step 1: 22,000 mg over 4 hours	1, 2, 10
	Step 2: 11,000 mg over 16 hours In massive overdose or on the advice of a toxicologist: 22,000 mg over 16 hours	CHQ-PROC-01230 Acetylcysteine (Intravenous) for Paracetamol Poisoning
	10 mg/kg/hour	7, 1, 2
Adrenaline <i>Child</i>	1 microg/kg/min Maximum 2 microg/kg/min at discretion of intensivist	5, 1, 2
Adrenaline <i>Adolescent</i>	40 microg/min	5, 1, 2
Alprostadil (PEG1)	400 nanog/kg/min	7, 1, 2, 6
Alteplase	100 mg/day	6, 5, 1, 2 CHQ-GDL-01403 Alteplase (rtPA) Infusion for Thromboembolism
Alteplase <i>STROKE</i>	Bolus: 9 mg Infusion: 81 mg Maximum total dose: 90 mg	5, 1, 2 CHQ-GDL-00734 Acute Arterial Ischaemic Stroke Management in Children
Aminocaproic Acid	30 g/day or 18 g/m ² /day	5, 7, 2
amiNOPHYLLine	1,139 mg/day unless guided by serum concentrations	5, 6, 1, 2
amiODAROne	Load: 300 mg Maintenance: 900 mg/day Total dose over 24 hours: 1,200 mg	9, 6, 5, 4, 2, 1,
Arginine (L-arginine)	≤40 kg: 25 mg/kg/hour >40 kg: 21 mg/kg/hour	6, 1, 2
Argipressin DI	0.01 units/kg/hour	4, 5, 7, 1, 2

Medication	Usual maximum dose	Reference (refer to page 84–86)
Argipressin BP	0.48 unit/kg/hour	5, 7, 1, 2
Argipressin BP >20kg	6 unit/hour	5, 1, 2
Argipressin GI	1 unit/kg/hour	5, 6, 1, 2
Argipressin GI	48 unit/hour	5, 1, 2
Arterial Heparinised Saline		5
Atropine	2.4 mg/kg/hour	10
Bivalirudin	1.8 mg/kg/hour	13, 1, 2
Calcium Chloride	Usual maximum 0.34 mmol/kg/hour Rate up to 0.68 mmol/kg/hour may be required for citrated CVVH	5, 7, 1, 2 CHQ-PMG-01270 Intravenous Calcium
Calcium Gluconate	Usual max 0.34 mmol/kg/hour Rate up to 0.68 mmol/kg/hour may be required for citrated CVVH	5, 6, 7, 1, 2 CHQ-PMG-01270 Intravenous Calcium
Calcium Gluconate <i>Plasma exchange</i>	0.68 mmol/kg/hour	7 CHQ-PMG-01270 Intravenous Calcium CHQ-GDL-14036 Management of patients receiving Therapeutic Plasma Exchange (TPE)
Cisatracurium	10 microg/kg/min	5, 7, 1, 2, 21, 55
Clonidine	3 microg/kg/hour	15, 16, 17
Danaparoid	7 unit/kg/hour	6, 18, 1, 2
Desferrioxamine	80 mg/kg in 24 hours, not to exceed 6 gram in 24 hours	4, 6, 1, 2

Medication	Usual maximum dose	Reference (refer to page 84–86)
Dexmedetomidine	Usual max 1.5 microg/kg/hour Rates as high as 2.5 microg/kg/hour have been used	4, 5, 1, 2
Dobutamine	20 microg/kg/min Maximum 30 microg/kg/min at discretion of intensivist	4, 5, 7, 1, 2
Dopamine	20 microg/kg/min Maximum 30 microg/kg/min at discretion of intensivist	6, 7, 1, 2
Epoprostenol (<i>Flolan</i> [®] brand)	80 nanog/kg/min	4, 5, 54 CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension
Epoprostenol Chronic (<i>Flolan</i> [®] brand)	195 nanog/kg/min	19 CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension
Epoprostenol (<i>Veletri</i> [®] brand)	80 nanog/kg/min	4, 5, 54 CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension
Epoprostenol Chronic (<i>Veletri</i> [®] brand)	195 nanog/kg/min	19 CHQ-GDL-01027 Epoprostenol Infusion for Pulmonary Arterial Hypertension
Esmolol	1,000 microg/kg/min	4, 5, 7
Ethacrynic Acid	0.8 mg/kg/hour	8, 5, 20
Ethanol 10%	100 mL/hour On haemodialysis: 4 mL/kg/hour (Maximum 200 mL/hour)	11, 1
Fentanyl	20 microg/kg/hour	5, 6, 7, 1, 2
Fentanyl >35kg	Usual maximum 300 microg/hour Rates as high as 700 microg/hour have been used	5, 1, 2
Flumazenil	10 microg/kg/hour (Maximum 500 mg/hour)	11, 1, 2

Medication	Usual maximum dose	Reference (refer to page 84–86)
Fomepizole	1.5 mg/kg/hour	7, 1
Furosemide	2 mg/kg/hour	4, 6, 1, 2
Glucagon	50 microg/kg/hour For beta-blocker poisoning: 150 microg/kg/hour (Maximum 10 mg/hour) – consider alternative dilution	5, 6, 10, 1, 2
Glucose 50%	25 mg/kg/min	7, 1
Glyceryl Trinitrate	10 microg/kg/min Maximum 15 microg/kg/min at discretion of intensivist	6, 7, 1, 2, 8
Glyceryl Trinitrate >45kg	200 microg/min	5, 6, 7
Heparin	60 unit/kg/hour Refer to haematologist if the rate exceeds 40 unit/kg/hour	5, 1, 2 CHQ-PMG-01200 Heparin Sodium (Unfractionated Heparin)
Heparin ECLS	100 unit/kg/hour	6, 1, 2 CHQ ECLS manual and clinical guideline
hydrALAZINE	360 microg/kg/hour (Maximum 18,000 microg/hour)	6, 21, 1, 2
HYDRomorphone	160 microg/kg/hour	4, 5, 22, 1, 2
Insulin (Actrapid®)	0.2 unit/kg/hour	4, 7, 1, 2
Isoprenaline	2 microg/kg/min	5, 7, 1, 2, 21
Isoprenaline ≥10kg	Usual maximum 20 microg/min Rates as high as 30 microg/min have been used	5, 7, 1, 2, 21

Medication	Usual maximum dose	Reference (refer to page 84–86)
Ketamine	Analgesia and opioid tolerance: Usual maximum 17 microg/kg/min	23, 24, 1, 2
	60 microg/kg/min	5, 1, 2
	Refractory Status Epilepticus: 100 microgram/kg/min Rates as high as 167 microg/kg/min have been used	25 CHQ-GDL-80028 Management of Refractory Status Epilepticus in Children
	Metabolism of medications and pharmacokinetics are often different between children and adults. Therefore higher doses of Ketamine are require in children compared to adults	
Labetalol	Neonates: 4 mg/kg/hour Infants, children and adolescents: 3 mg/kg/hour	5, 6, 1, 2
Levocarnitine	12 mg/kg/hour	5, 6, 7, 1, 2
Levosimendan	0.3 microg/kg/min	8, 1, 2 CHQ-PMG-01459 Levosimendan
Lidocaine	Arrhythmias: 3 mg/kg/hour Refractory Status Epilepticus: 7 mg/kg/hour	6, 7, 1, 2 CHQ-GDL-01458 Common arrhythmias and their management in the PICU 5, 6, 7 CHQ-GDL-80028 Refractory Status Epilepticus Management in Children
Liothyronine	0.2 microg/kg/hour Rates as high as 0.6 microg/kg/hour have been used	5, 9, 26, 1, 2
LORazepam	Usual maximum 120 microg/kg/hour Rates as high as 330 microg/kg/hour have been used High doses increase the risk of propylene glycol toxicity: monitor closely	27, 28, 29, 7
Magnesium Sulfate	0.5 mmol/kg/hour	2, 6, 7 CHQ-PMG 01246 Magnesium Sulfate Intravenous CHQ-GDL-80028 Refractory Status Epilepticus Management in Children

Medication	Usual maximum dose	Reference (refer to page 84–86)
Metaraminol	5 microg/kg/min	8, 9, 1, 2
methADONe	Guided by palliative care consultant and/or intensivists For terminal illness: Highest rate at QCH 0.54 mg/kg/hour Highest rate documented in case reports: 2 mg/kg/hour	30, 31, 32
Methylene Blue	2 mg/kg/hour	9, 33, 1 2
Metoprolol	5 microg/kg/min (Maximum 110 microg/min)	6, 9, 34, 1, 2
Midazolam	300 mg/kg/hour	6, 7, 1, 2
Midazolam	20 mg/hour Maximum of 40 mg/hour at the discretion of the intensivist	5, 35, 36, 1, 2
Midazolam Status	Usual maximum 2,000 microg/kg/hour Rates as high as 3,000 microg/kg/hour have been used	7, 1, 2 CHQ-GDL-80028 Management of Refractory Status Epilepticus in Children
Milrinone	1 microg/kg/min Maximum 1.25 microg/kg/min at discretion of intensivist	4, 7, 1 ,2
Morphine	150 microg/kg/hour	7, 1,2
Morphine	20 mg/hour Maximum of 40 mg/hour at the discretion of the intensivist	50
Naloxone	Opioid-induced itch: 3 microg/kg/hour Opioid overdose (full reversal): Usual maximum 40 microg/kg/hour Rates as high as 160 microg/kg/hour have been used	5, 7, 1, 2
Nesiritide	Usual maximum 0.03 microg/kg/min Rates as high as 0.09 microg/kg/min have been used in ECMO (may be related to nesiritide incompatibility with heparin)	7, 37
niCARDipine	6 microg/kg/min (Maximum 15 mg/hour) Rates as high as 10 microg/kg/min (Maximum 15 mg/hour) have been used	5, 7, 1

Medication	Usual maximum dose	Reference (refer to page 84–86)
niMODIPine	30 microg/kg/hour (Maximum 2,000 microg)	6, 1, 21
Noradrenaline	1 microg/kg/min Maximum 2 microg/kg/min at discretion of intensivist	5, 1, 2
Noradrenaline	40 microg/min Maximum 100 microg/min at discretion of intensivist	
Octreotide	Oesophageal varices and bleeding: 2 microg/kg/hour (Maximum 50 microg/hour) Chylothorax: Usual maximum 10 microg/kg/hour (Maximum 200 microg/hour) Rates as high as 20 microg/kg/hour (Maximum 200 microg/hour) have been used	5, 6, 7, 52, 53
Omeprazole	0.2 mg/kg/hour (Maximum 8 mg/hour)	6, 1, 38, 39, 40
oxyCODONE	Rate guided by Acute Pain Service	www.rch.org.au/anaes/pain_management/Opioid_Infusion/
Pantoprazole	0.2 mg/kg/hour (Maximum 8 mg/hour)	41, 1, 2 [extrapolation from adults, based on population pharmacokinetic study]
Phentolamine	50 microg/kg/min (Maximum 120 mg/hour) For phentolamine infusions we recommend caution to not exceed 40 mg/hour as an initial dose, which would be reached at a body weight of above 65 kg and 10 microg/kg/min infusion rate	5, 8, 9, 2
Phenylephrine	5 microg/kg/min (Maximum 180 microg/min) Rates as high as 15 microg/kg/min (Maximum 200 microg/min) have been used	5, 6, 7, 42, 2
Phosphate (Sodium Dihydrogen Phosphate)	0.2 mmol/kg/hour (Maximum 20 mmol/hour)	2, 6, 1
Potassium	0.5 mmol/kg/hour (Maximum 40 mmol/hour)	CHQ-PMG-01213 Potassium for Paediatric Patients – oral and intravenous
Pralidoxime	20 mg/kg/hour (Maximum 500 mg/hour)	7, 11, 1, 2
Procainamide	120 microg/kg/min (6 mg/min) Total of 2g per day	5, 7, 2, 8

Medication	Usual maximum dose	Reference (refer to page 84–86)
propOFol	Usual 4 mg/kg/hour (Maximum 300 mg/hour) Maximum 7 mg/kg/hour (Maximum 450 mg/hour) at discretion of intensivist Infusion durations over 48 hours or doses over 3mg/kg/hour increase the risk of propofol infusion syndrome	6, 7, 4, 1
Remifentanyl	Usual 1 microg/kg/min Rates as high as 5 microg/kg/min have been used	1, 2, 9, 43, 44
Rocuronium	15 microg/kg/min	5, 6, 7, 9
Salbutamol	5 microg/kg/min	6, 1 CHQ-GDL-80112 Management of Severe Acute and Life-Threatening Asthma in PICU
Sodium Benzoate	20.8 mg/kg/hour (Maximum 12 gram/day)	12
Sodium Benzoate/ L-arginine	Sodium benzoate: 12 gram/day L-arginine: 12 gram/day	12 CHQ-GDL-04313 Administration of Intravenous SODIUM BENZOATE and L-ARGININE HYDROCHLORIDE in children with hyperammonaemia associated with a urea cycle defect
Sodium Bicarbonate	Usual 1 mmol/kg/hour Rates as high as 2 mmol/kg/hour has been used (when pH <6.9)	5, 7, 1, 2
Sodium Chloride 3%	Acutely symptomatic hyponatraemia: 1 mmol/kg/hour (Maximum 100 mL/hour) Non-symptomatic: 0.25 mmol/kg/hour	5, 7
	2.4 mmol/kg/hour	7, 45, 46
Sodium nitroPRUSSide	4 microg/kg/min for infusion longer than 24 hours 10 microg/kg/min for infusion 10 minutes or less	6, 7, 1, 2
Sodium Thiosulfate	To prevent cyanide toxicity: 6 mg/kg/hour To prevent cisplatin toxicity: 2 gram/m ² /hour (approx. 50 mg/kg/hour) for 5 to 12 hours	8, 10, 47, 5

Medication	Usual maximum dose	Reference (refer to page 84–86)
Sodium Valproate	6 mg/kg/hour	5, 7, 1, 2 CHQ-GDL-80028 Refractory Status Epilepticus Management in Children
TACrolimus	6.25 microg/kg/hour	7, 1, 2 CHQ-PMG-01235 Intravenous Tacrolimus
Thiopental	12 mg/kg/hour Rates as high as 55 mg/kg/hour have been used for Refractory Status Epilepticus	6, 7, 8, 1, 2 CHQ-GDL-80028 Refractory Status Epilepticus Management in Children
TOX Lipid 20% (Fat emulsion 20%)	30 mL/kg/hour Maximum cumulative dose of 12 mL/kg	48, 1 CHQ-GDL-00731 Local Anaesthetic Systemic Toxicity
Tranexamic Acid	10 mg/kg/hour	7 CHQ-WI-80113 PICU: Acute Bleeding Guideline
Vancomycin	Dose guided by vancomycin steady state serum concentrations (Aim 20 to 25 mg/L)	1,2 CHQ Vancomycin Therapeutic Drug Monitoring
Vecuronium	Usual 4.5 microg/kg/min Rates as high as 10 microg/kg/min have been used	7, 9, 49, 5, 1, 2
Vecuronium ≥20kg	10 mg/hour	5, 1, 2

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This document does not include the complete information, consult published references regarding duration of infusion and line changes.

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*Glycol concentration in critically ill adults**

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Appendix 1: Consensus rationale

CIDD contains evidence-based and clearly referenced medicines information and is intended to reduce unwarranted variation in medication preparation and administration. Throughout CIDD, we have endeavoured to meet the preferences of all facilities providing care to critically unwell paediatric patients. For some medications, the following rationales are provided and have been discussed at length and endorsed with paediatric staff specialists, pharmacy, and nursing expertise.

Use of weight limits:

There is no clear guidance or evidence for when to change to an adult dosing regimen in paediatric patients. We recommend seeking advice from the pharmacist for large-for-age or large-for-height patients.

For some medications, we have decided to use a certain weight cut-off to avoid excessive dosages in larger patients; whereby usual adult dosing range would be exceeded if weight-based dosing regimens were continued to be used. Above this cut-off, adult dosing regimens should be used, (i.e. change from unit/kg/unit to unit/unit).

The medication infusions for which we have decided to do this for (in version one of CIDD) are **amiodarone, argipressin (vasopressin), fentanyl, glyceryl trinitrate, isoprenaline, ketamine, midazolam and vecuronium.**

Vice versa, we recommend using unit/kg/unit dosing as provided in CIDD for patients below the specified weight.

Propofol:

The recommended dose for propofol in children and adults are both dosed in mg/kg/hour and is therefore left in this dosing regimen.

Morphine:

For morphine we decided to not change to mg/hour, because for patients up to 100 kg bodyweight, the paediatric dosing would not exceed the usual adult dose range.

Inotropes and vasopressors:

Inotropes and vasopressors were deliberately left in paediatric dosage units, as the dose should be guided by the desired effect of the drug.

Neuro-muscular blockade:

In patients requiring continuous neuro-muscular paralysis with vecuronium or cisatracurium infusions we emphasise the use of Train of Four (TOF) monitoring. We recommend targeting two evoked muscular responses out of four peripheral nerve stimulations (2/4) as per QCH guidelines [CHQ-WI-80106](#).

Appendix 2: Glossary

Term	Definition
Access (IV)	Intravenous (IV) cannulation is a technique in which a cannula is placed inside a vein to provide venous access. Allowing intravenous medication administration
ACT	Activated Clotting Time
anti-Xa	Test to monitor blood clotting in patients given anticoagulant therapy (e.g. low molecular weight heparin)
aPTT	Activated partial thromboplastin time - measure of clotting time
Blood pressure (BP)	Pressure of blood within the arteries in mmHg. Monitoring includes Systolic and Diastolic pressures.
Bolus	Single large dose of medicine, given at one time
Cardiac monitoring	Cardiac telemetry – ECG, heart rate, respiratory rate, oxygen saturation monitoring
Central access preferred	Preferred route of administration preferred is via large central vein
Central access required	Required route of administration required is via large central vein
DERS	Dose Error Reduction Software
ECG	Electrocardiogram
ECLS	Extracorporeal Life Support
ECMO	Extracorporeal Membrane Oxygenation
Extravasation	Leakage of medication/fluids from vein, into surrounding tissue. Can cause blistering, tissue sloughing or necrosis if fluid is vesicant
Glucose monitoring	Capillary blood analysed to show blood glucose level

Term	Definition
ICP	Intracranial pressure
In-line filter	Filter membrane on IV access line. Can prevent air or particles entering the venous circulation
Loading dose	Initial higher dose to rapidly attain a required medicine concentration
Large volume pump	Infusion pump capable of delivering large volume fluid/medicine infusions
Precipitation	Undesirable formation of an insoluble solid in an IV solution
Pressure bag	Device applied to an IV fluid bag - increases deliver rate
Special access scheme (SAS)	Scheme to access medications that are not licensed for use in Australia under the Australian Register of Therapeutic Goods
Respiratory monitoring	Respiratory rate, pattern and effort of breathing evaluation, Oxygen saturation and delivery
Standard concentration	Concentration suitable for most, non-fluid restricted patients
Syringe pump	Small infusion pump. Gradually administer small volume medication or fluid infusions (usually up to maximum 50 mL)
Taper	Gradual reduction or discontinuation of a medication over a specified period or time
Therapeutic drug monitoring	Measurement of medicine (drug) concentration in plasma, serum or blood, to individualise dosage and maintain medicine concentrations within a target range
Titrate	Process of adjusting medication dose – up or down
Train of Four monitoring	Peripheral nerve stimulator used to assess neuromuscular transmission when neuromuscular blocking agents are being administered

Appendix 3: Blank concentration medicines

Blank Concentration Medicines administered by continuous infusion in standard concentrations that additionally require blank concentrations built into Dose Error Reduction Software (DERS). In DERS language a 'blank' concentration is defined as the ability to modify both the amount of medicine, and the volume to individualise a concentration. Blank concentrations are rarely required and should only be used in severely fluid restricted patients, or during significant medication shortages. Consultant approval is recommended for the use of any blank concentration for patient safety.

- Acetylcysteine
- Adrenaline (epinephrine)
- Aminocaproic acid
- Aminophylline
- Amiodarone
- Arginine
- Argipressin
- Atropine
- Bivalirudin
- Botulism immune globulin
- Calcium chloride
- Calcium gluconate
- Cisatracurium
- Danaparoid
- Desferrioxamine
- Dexmedetomidine
- Dobutamine
- Dopamine
- Epoprostenol
- Esmolol
- Ethacrynic Acid
- Fentanyl
- Flumazenil
- Furosemide (frusemide)
- Glucagon
- Glyceryl trinitrate
- Hydralazine
- Hydromorphone
- Insulin (ACTRAPID)
- Isoprenaline
- Ketamine
- Labetalol
- Levocarnitine
- Levomepromazine
- Lidocaine (lignocaine)
- Lorazepam
- Magnesium sulfate
- Metaraminol
- Methadone
- Methylene blue
- Metoprolol
- Midazolam
- Milrinone
- Morphine
- Naloxone
- Nesiritide
- Nicardipine
- Noradrenaline (norepinephrine)
- Octreotide
- Omeprazole
- Oxycodone
- Pantoprazole
- Phentolamine
- Phenylephrine
- Pralidoxime
- Procainamide
- Propofol
- Remifentanyl
- Rocuronium
- Sodium benzoate
- Sodium bicarbonate
- Sodium nitroprusside
- Sodium thiosulfate
- Sodium valproate
- Tacrolimus
- Thiopentone
- Tranexemic acid
- Vecuronium

Appendix 4: Authors and acknowledgments

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The CIDD concept and layout have been endorsed by the Children's Health Queensland Medicines Advisory Committee and is suitable to be considered for use at all Queensland Health facilities treating critically unwell paediatric patients.

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